Fisheries in European Marine Sites (EMS): Habitats Regulations Assessment Fal Fishery Order 2016 – 2022/23 Season

Site and features/ sub-features assessed:

European Marine Site:	Fal and Helford Special Area of Conservation (SAC) UK0013112	
Qualifying feature(s):	1110 Sandbanks which are slightly covered by seawater all the time 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide[1] 1160 Large shallow inlets and bays 1170 Reefs[1] 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	
Annex I sub-feature(s):	Intertidal mixed sediments Intertidal mud Intertidal sand and muddy sand Intertidal coarse sediment Intertidal seagrass beds Intertidal rock Infralittoral rock Atlantic salt meadows	Subtidal mixed sediments Subtidal mud Subtidal sand Subtidal coarse sediment Subtidal seagrass beds Circalittoral rock Maerl beds
Annex II species	1441 Shore dock (*Rumex rupestris*)	

Fishing activities assessed at this site: Fal Fishery Order 2016

	Simple Screen	LSE	Appropriate assessment
Intertidal mixed sediments	X	X	X
Intertidal mud	X	X	X
Intertidal sand and muddy sand	X	X	X
Intertidal coarse sediment	X	X	X
Subtidal mixed sediments	X	X	X
Subtidal mud	X	X	X
Subtidal sand	X	X	X
Subtidal coarse sediment	X	X	X
Intertidal rock	X	X	X
Infralittoral rock	X	X	X
Circalittoral rock	X	X	X
Maerl beds	X	X	X
Intertidal seagrass beds	X	X	X
Subtidal seagrass beds	X	X	X
Atlantic salt meadows	X	X	X
Shore dock	X		

Summary of what this assessment covers:
This assessment covers the issuing of licences to use hand hauled oyster dredges towed by sail and oar powered vessels, and hand gathering under Regulation of the Fal Fishery Order 2016 in line with the associated management for the 2022-23 season and the subsequent potential impact of the activity with all features of the Fal and Helford Special Area of Conservation (SAC) inshore of six nautical miles. This assessment was carried out by Cornwall Inshore Fisheries and Conservation Authority (Cornwall IFCA).

Cornwall IFCA reference
FEMSA_F&H_FOF_2022

[1] Annex I habitats present as a qualifying feature, but not a primary reason for selection of the site.

Document Control

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Author	S Sturgeon
Approver	C Trundle
Owner	Cornwall IFCA
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Review period	This will be reviewed every year, or if the levels of activity increase above the effort levels specified in Section 17.

Revision History

Date	Author	Version	Status	Reason
05/08/2022	S Sturgeon	V0.1	Draft	
10/08/2022	C Trundle	V0.2	Draft	QA
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12/08/2022	S Sturgeon	V0.2	Draft	Amendments from QA
27/09/2022	S Sturgeon	V0.3	Final	Formal advice from Natural England

Distribution List

This document has been distributed for information and comment to:

Organisation	Date sent	Comments
Natural England	12/08/2022	Sent for formal advice

1. Introduction

1.1 Need for a HRA assessment

As a competent authority, Cornwall IFCA (Inshore Fisheries and Conservation Authority) has important statutory duties and responsibilities as defined in the Conservation of Habitats and Species Regulations 2010 (as amended) ('the Habitats Regulations'), which transpose the European Habitats Directive 1992 and Wild Birds Directive 2009 ('the Directives') into English law.

The European Directive (92/43/EEC) on the Conservation of Natural Habitats and Wild Flora and Fauna (the Habitats Directive) protects habitats and species which are designated as being of European nature conservation importance. The European Directive (79/409/EEC) on the Conservation of Wild Birds (the Birds Directive) provides a comprehensive scheme of protection for all wild bird species naturally occurring in the EU.

The Habitats Directive establishes a network of internationally important sites, designated for their ecological status. These are known as Natura 2000 sites or European sites. These sites include candidate and Special Areas of Conservation SACs (cSACs and SACs), designated under the Habitats Directive and potential and Special Protection Areas (pSPAs and SPAs), designated under the Birds Directive.

In accordance with the Habitats Regulations, all English competent authorities, including Cornwall IFCA, must undertake a formal assessment of the implications of any new plans or projects which are capable of affecting the designated interest features of European Sites before deciding whether to undertake, permit or authorise such a plan or project.

The assessment comprises several distinct stages which are conveniently and collectively described as a 'Habitats Regulations Assessment' (or HRA). A HRA is required where any plan, alone or 'in combination' with other plans, could have a significant effect on the integrity of international sites. It is required to assess the potential effects arising from a plan against the conservation objectives of any site designated for its nature conservation importance.

For all plans and projects which are not wholly directly connected with or necessary to the conservation management of the site's qualifying features, this will include formal screening for any Likely Significant Effects (LSE) (either alone or in combination with other plans or projects). Where these effects cannot be excluded, assessing them in more detail through an appropriate assessment (AA) is required to ascertain whether an adverse effect on the integrity of the site can be ruled out. Where such an adverse effect on the site cannot be ruled out, and no alternative solutions can be identified, then the project can only then proceed if there are imperative reasons of over-riding public interest and if the necessary compensatory measures can be secured.

Article 6 (3) of the Habitats Directive gives the following guidance on when HRA should be undertaken:

'Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.'

The issuing of permits/ licences constitutes as a plan or project under the ruling of the European Court of Justice Waddenzee case (Case C-127/02, 2004). This ruling is being incorporated as licences are issued under the Fal Fishery Order 2016.

Assessments of existing fisheries activities, plans and projects are being carried out in a manner that is consistent with the provisions of Article 6(3) of the Habitats Directive and the Habitats Regulation Assessment (HRA) process. For existing plans and projects, site specific assessments are being

completed under the provision of Article 6(3) of the Habitats Directive and Regulation 9 of the Habitats Regulations 2010. The purpose of this assessment is to ascertain whether the fishing activities stated above (front page) have an effect equivalent to a LSE, or an Adverse Effect on Integrity (AEOI) of, the feature/ sub-features of the European Marine Sites EMS(s). The assessment will determine whether management measures are required in order to ensure that assessed fishing activity or activities will have no adverse effect on the integrity of the EMS.

Cornwall IFCA is implementing the assessment process in three stages:

- **Simple screening**: Is the activity capable of adversely affecting the feature?
  Does the activity take place within the SAC?

- **Test for Likely Significant Effect (LSE) (Stage 1)**: Is the activity capable of having a 'likely significant effect', either individually or in combination with other plans and projects on the integrity of the site.

- **Appropriate Assessment (Stage 2)**: Triggered if any plan or project can have a LSE either individually or in combination with other plans or projects.

1.2 Documents reviewed to inform this assessment

- Natural England's risk assessment matrix of fishing activities and European habitat features and protected species[2]
- Natural England's Conservation Objectives for Fal and Helford SAC (Natural England, 2018)
- Natural England's Citation for Fal and Helford SAC (Natural England, 2014)
- Natural England's Conservation Advice (Natural England, 2021)
- Reference List (Section 19)
- Site map (Annex 1)
- Feature map (Annex 2)
- Fishing activity levels (Annex 3)
- Adaptive risk review process (Annex 4)
- Natural England's consultation advice (Annex 5)

2. Information about the EMS

- Fal and Helford SAC[3]

The Fal and Helford SAC is located on the southern coastline of west Cornwall. The seaward boundary of the site is defined by a line that runs between Zone Point in the northeast of the site and Manacle Point in the southwest.

The site is complex comprising of the Fal and Helford ria systems (drowned river valleys) and Falmouth Bay. Both ria systems receive low freshwater input and therefore contain a notable range of fully marine habitats with a high diversity of species across the majority of the site. These habitats are highly influenced by the degree of exposure of the site which varies greatly from extremely sheltered mudflats in the upper Fal to more exposed rocky coastal areas around the mouth of the Helford. Furthermore, the south-westerly location promotes warmer seawater temperatures which allow species to occur that are usually more southerly in their distribution.

The majority of the shores of the upper Fal and Helford are fringed by sheltered intertidal sandflats and mudflats which are recognised for their important sediment dwelling species and communities. These

[2] See Fisheries in EMS matrix: https://www.gov.uk/government/publications/fisheries-in-european-marine-sites-matrix
[3] Natural England Conservation Advice for Marine Protected Areas: Fal and Helford SAC
https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0013112

mudflats and sandflats support a wide range of invertebrate and bird communities, which make a vital contribution to the structure and function of the Fal and Helford system.

In several areas of the upper reaches of the estuaries, Atlantic salt meadows are present. Salt meadow transition from mudflats through to woodland also occurs which is a rare occurrence in the UK.

In the lower Fal and Falmouth Bay, extensive beds of the unattached coralline red algae maerl are present which support a high diversity of flora and fauna, including large numbers of thornback rays *Raja clavata*. These maerl beds are classified as Habitats of Principal Importance/ Priority Habitats under the Natural Environment and Rural Communities Act 2006 (NERC) and are the most south-westerly examples in Britain. Other Priority Habitats within the site include subtidal seagrass beds *Zostera marina*, which are present in both the Fal and the Helford. These seagrass beds act as nursery areas for species such as bass *Dicentrarchus labrax*, and cuttlefish, and also important habitats for a variety of other species. Intertidal seagrass beds are present in the Fal Ruan. The site also supports a population of native oyster *Ostrea edulis*, which supports a traditional commercial fishery.

Both intertidal and subtidal rocky reef features are also present in the SAC. This includes circalittoral reef in Falmouth Bay which supports the nationally important pink sea fan *Eunicella verrucosa*. Other rocky habitats include highly productive kelp forest communities, estuarine reef and littoral rocky shore communities.

A chart showing the location of the Fal and Helford SAC is shown in Annex 1.

2.1 Overview and qualifying features[4]

Annex I habitats that are a primary reason for selection of this site

- **1110 Sandbanks which are slightly covered by seawater all of the time**
  - Sub-tidal mixed sediments
  - Sub-tidal coarse sediments
  - Sub-tidal sand
  - Subtidal seagrass beds
  - Maerl beds
- **1140 Mudflats and sandflats not covered by seawater at low tide**
  - Intertidal mixed sediments
  - Intertidal coarse sediments
  - Intertidal mud
  - Intertidal sand and muddy sand
  - Intertidal seagrass beds
- **1160 Large shallow inlets and bays**
  - Intertidal coarse sediment
  - Intertidal sand and muddy sand
  - Sub-tidal mixed sediments
  - Sub-tidal mud
  - Sub-tidal sand
  - Subtidal seagrass beds
  - Intertidal rock
  - Infralittoral rock
  - Circalittoral rock
  - Maerl beds
- **1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)**

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

- **1130 Estuaries**
  - Intertidal coarse sediment
  - Intertidal mixed sediments
  - Intertidal mud
  - Intertidal sand and muddy sand
  - Sub-tidal mixed sediments
  - Sub-tidal mud
  - Subtidal seagrass beds
  - Infralittoral rock
  - Maerl beds
- **1170 Reefs**
  - Intertidal rock
  - Infralittoral rock
  - Circalittoral rock

Annex II species that are a primary reason for selection of this site

- **1441 Shore dock (*Rumex rupestris*)**

[4] JNCC (2020)

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Intertidal coarse sediments

Intertidal coarse sediments occur infrequently by comparison with other intertidal sediments found in the site. The majority of coarse sediments are present in the Helford and Gillan creek, although there are small patches found in the Percuil River at Amsterdam Point which are exposed to fully marine conditions at the mouth of the Fal. In the few areas of the site where intertidal coarse sediments are found, the larger size sediment fraction provides habitat for seaweeds which support species including the common shore crab *Carcinus maenas*, the periwinkle *Littorina littorea*, and the flat top shell *Gibbula umbilicalis* (Tompsett and H.M.V.C.A. Group, 2011).

Condition assessment: (Natural England, 2020)

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1130 Estuaries	A2.1 - Intertidal coarse sediment	01/06/2018	Unfavourable - No Change	Low
H1160 Large shallow inlets and bays	A2.1 - Intertidal coarse sediment	01/06/2018	Unfavourable - No Change	Low
H1140 Mudflats and sandflats not covered by seawater at low tide	A2.1 - Intertidal coarse sediment	01/06/2018	Unfavourable - No Change	Low

Intertidal mixed sediments

Intertidal mixed sediments can be found in both estuaries with areas also present in Gillan Creek and the Percuil River. Within the site, mixed sediments include a full range of sediment sizes from fine silts and clays through to pebbles. The intertidal mixed sediments provide habitats for a variety of species, primarily bivalves such as the common cockle *Cerastoderma edule* as well as the native oyster *Ostrea edulis*, a Biodiversity Action Plan (BAP) species. In some areas of the site, mixed sediments also support small beds of blue mussel *Mytilus edulis* (Curtis, 2011). Interesting species associated with this feature in the site include the massive sponge *Hymeniacidon perleve*, and peacock worm *Sabella pavonina*, which is found on the lower shore between Helford Point and Frenchman's Creek. In Gillan creek, a small area of gravelly muddy sand is present. Infauna includes the common cockle *Cerastoderma edule* and various oligochaetes and polychaetes. Fauna includes common shore crabs *Carcinus maenus*, and flat top shells *Gibbula umbilicalis* (Curtis, 2011). Further patches of mixed sediment are found on the Helford which support a diverse seaweed assemblage as well as a variety of infauna including the sand mason worm *Lanice conchilega* (Curtis, 2011).

Condition assessment: (Natural England, 2020)

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1130 Estuaries	A2.4 - Intertidal mixed sediments	02/03/2020	Unfavourable - No Change	Low
H1140 Mudflats and sandflats not covered by seawater at low tide	A2.4 - Intertidal mixed sediments	02/03/2020	Unfavourable - No Change	Low

Intertidal sand and muddy sand

Sand and muddy sand habitats are extensive and highly productive habitats which are important to both the structure and functioning of the wider interest feature. These sediment zones are a common feature of both the upper Fal and Helford Estuaries and associated tributaries and creeks. Intertidal sand and muddy sand can also be found in the Percuil River. At Amsterdam Point, species associated with these sandier sediments such as the sea cucumber *Trachythyone elongata*, have only been recorded in this locality. Other characteristic species recorded on the site include the burrowing heart urchin *Echinocardium cordatum*, and the razor shell *Ensis arcuatus*. The common and black brittle stars *Ophiura ophiura* and *Amphiura brachiata* respectively which have a preference for sandy substrates and high salinity have also been recorded (Moore *et al.,*1999). Intertidal sand south of Ardevora Veor in the River Fal supports the only area of intertidal seagrass *Zostera noltii* found within the site. This feature supports other rich and diverse

communities throughout the site including species of common cockle *Cerastoderma edule*, the peacock worm *Sabella pavonina*, and dense beds of sand mason worm *Lanice conchilega*.

Condition assessment: (Natural England, 2020)

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1130 Estuaries	A2.2 - Intertidal sand and muddy sand	02/03/2020	Unfavourable - No Change	Low
H1160 Large shallow inlets and bays	A2.2 - Intertidal sand and muddy sand	02/03/2020	Unfavourable - No Change	Low
H1140 Mudflats and sandflats not covered by seawater at low tide	A2.2 - Intertidal sand and muddy sand	02/03/2020	Unfavourable - No Change	Low

Intertidal mud

Areas of intertidal mud found within the site are highly productive systems and form a critical part of the food chain. The mudflats contain extensive and varied infaunal communities which are dominated by burrowing worms, as well as rich in bivalves and other invertebrates. Intertidal mud characterises the upper reaches of both the Fal and Helford Estuaries. In the Fal, these intertidal muds are present in the upper Tresillian River and River Fal, and in the Helford, they dominate many of the creeks and upper estuary areas. The infaunal communities inhabiting these mud flats vary throughout the site although common species are present throughout this habitat which include; the catworm *Nephytys hombergii* and ragworm *Hediste diversicolor*. Species of oligochaetes and gastropod snails are also recorded in high numbers (Curtis, 2011). Other species of interest include the Baltic tellin *Macoma balthica*, the peacock worm *Sabella pavonina*, and the peppery furrow shell *Scrobicularia plana*. In some areas the intertidal mudflats provide important feeding grounds for internationally important numbers of wildfowl.

Condition assessment: (Natural England, 2020)

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1130 Estuaries	A2.3 - Intertidal mud	02/03/2020	Unfavourable - No Change	Low
H1140 Mudflats and sandflats not covered by seawater at low tide	A2.3 - Intertidal mud	02/03/2020	Unfavourable - No Change	Medium

Subtidal coarse sediment

Subtidal coarse sediment complements the full range of sediments present within the site. These coarser sediments, range through coarse sands to pebbles and small boulders, in some instances exist with a proportion of dead crushed maerl and are mainly restricted to patches throughout the open Falmouth Bay. This habitat provides attachment for hydroids and erect bryozoans attached to stones and shells, with dense brittle star beds also recorded (Davies and Sotheran, 1995).

Condition assessment: (Natural England, 2020)

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1110 Sandbanks which are slightly covered by sea water all the time	A5.1 - Subtidal coarse sediment	01/06/2018	Favourable	Low

Subtidal mixed sediments

Throughout the Fal and Helford estuaries and Falmouth Bay, extensive areas of mixed sediment are found. Their composition varies according to their location, however they all provide important habitats for a range of species and the presence of surface shells and stone in several of these locations, has enabled the development of diverse epifaunal communities (Allen and Proctor, 2003). Within the site, mixed sediments

forming part of the subtidal sandbanks are present in much of the Helford particularly west of the Helford Passage extending up the estuary to Groyne Point. From Groyne Point west, the mixed sediment appears to be more classically estuarine with a higher mud component (Moore *et al.*, 1999). With exception of the deep channel, the upper Carrick Roads is also characterised by subtidal mixed sediments. In the upper Carrick Roads, the native oyster *Ostrea edulis* is present along with the peacock worm *Sabella pavonina* and the anemone *Sagartiogeton undatus*. Large numbers of tube worms have been identified in the Helford along with several species of burrowing anemones. In Falmouth Bay, mixed sediment habitats exhibit characteristic epifauna including several species of brittle star, the common starfish *Asterias rubens*, the spiny starfish *Marthasterias glacialis* and the hermit crab *Pagurus bernhardus* (Ware and Meadows, 2012).

Condition assessment: (Natural England, 2020)

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1130 Estuaries	A5.4 - Subtidal mixed sediments	02/03/2020	Unfavourable - No Change	Medium
H1160 Large shallow inlets and bays	A5.4 - Subtidal mixed sediments	02/03/2020	Unfavourable - No Change	Medium
H1110 Sandbanks which are slightly covered by sea water all the time	A5.4 - Subtidal mixed sediments	02/03/2020	Unfavourable - No Change	Medium

Subtidal sand

Subtidal sand communities are found principally in the lower reaches of the ria systems and found at the mouth of the Helford River and around the coastal fringes of the site, as well as in some areas of Falmouth Bay. The main sandbanks are found at The Gew and Toll Point, with further significant areas found in the lower Percuil River and the Carrick Roads. At the mouth of the Helford River, east of The Gew and Toll Point, subtidal gravelly sands and sandy gravels are dominated by worms including nematodes and various species of polychaetes (Allen and Proctor, 2003). The rich fauna also includes bivalve molluscs and other typical sand-dwelling species such as the sea potato *Echinocardium cordatum* (Moore *et al.,* 1999). In Gillan Harbour, the sand mason worm *Lanice conchilega* reaches high abundances in shallow sandy substrates, and in some areas, dense growths of the red algae *Ceramium virgatum* cover the sand. Common fauna include the starfish *Asterias rubens*, the hermit crab *Pagurus bernhardus*, razor shells *Ensis spp*. and terebellid worms (Moore *et al.,* 1999).

Condition assessment: (Natural England, 2020)

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1160 Large shallow inlets and bays	A5.2 - Subtidal sand	01/06/2018	Unfavourable - No Change	Low
H1110 Sandbanks which are slightly covered by sea water all the time	A5.2 - Subtidal sand	02/03/2020	Unfavourable - No Change	Low

Subtidal mud

Subtidal muddy sediments of the Fal and Helford SAC contribute significantly to the overall functioning of the system by providing important feeding grounds for fish and are integral to maintaining the intertidal areas. The main subtidal muddy area of the site consist partly of the deep water channel running through the Carrick Roads as well as areas in the Percuil River, Falmouth Harbour and the upper Fal (Rostron and Nature Conservancy Council, 1986; Moore *et al.*, 1999; Allen and Proctor, 2003). The sediment composition varies depending on location with sandy muds present in the Helford and fine soft muds present in the upper Fal which in some places are a result of china clay deposits. Subtidal muds present in the estuaries support various oligochaete and polychaete species. Animal communities are generally more diverse in the shallower Percuil River in comparison with deeper channels found in the Carrick Roads. These shallower areas of subtidal mud support species including the common shore crab *Carcinus maenas*, the plumose anemone *Metridium senile*, and snakelock's anemone *Anemonia viridis* (Rostron and Nature Conservancy Council, 1986).

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Condition assessment: (Natural England, 2020)

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1130 Estuaries	A5.3 - Subtidal mud	01/06/2018	Unfavourable – No Change	Medium
H1160 Large shallow inlets and bays	A5.3 - Subtidal mud	02/03/2020	Unfavourable – No Change	Medium

Intertidal seagrass beds

Intertidal seagrass historically was fairly widespread on the Helford and as recently as the late 1980s, was recorded as including the largest area of intertidal *Zostera marina* in Cornwall (Hocking and Tompsett, 2002). Since site designation however, the intertidal seagrass species *Zostera noltii* has only been recorded as present in the upper reaches of the Fal Ruan towards Ardevora Veor (Environment Agency (EA), 2014).

Condition Assessment: (Natural England, 2020)

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1140 Mudflats and sandflats not covered by seawater at low tide	A2.61 - Intertidal seagrass beds	01/06/2018	Favourable	Low

Subtidal seagrass beds

Subtidal seagrass beds and their rich associated flora and fauna are found throughout the lower reaches of the SAC. Within the site they provide habitat for a variety of species of fish, mollusc, cnidarian, polychaete, crustacean and algae (Sutton *et al.,* 2000).

The largest seagrass beds are found in the Helford, between Polgwidden Cove and Toll Point, at Maenporth, and in the lower Percuil between Amsterdam Point and Carricknath Point, with further beds found in various sheltered shallow areas of the site (Curtis, 2015; Allen *et al.,* 2014; Hocking *et al.,* 2002).

The seagrass within the site provides habitat for a variety of species including various species of crab, the common starfish *Asterias rubens*, various species of brittle star, and the heart urchin *Echinocardium cordatum* (Rostron and Nature Conservancy Council, 1986; Ware and Meadows, 2012). The subtidal seagrass provides an important nursery zone for species including young pollack *Pollachius pollachius* and bass *Dicentrachus labrax*. The seagrass within the site also provides an important attachment point for some organisms, the most recognisable of these being the colourful snakelocks anemone *Anemonia viridis*. Many other species live attached to the seagrass with species of sea plume hydroid and various algae also identified in the site (Hocking *et al.,* 2002).

Condition Assessment: (Natural England, 2020).

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1130 Estuaries	A5.53 - Subtidal seagrass beds	01/06/2018	Unfavourable - No Change	Low
H1160 Large shallow inlets and bays	A5.53 - Subtidal seagrass beds	01/06/2018	Unfavourable - No Change	Low
H1110 Sandbanks which are slightly covered by sea water all the time	A5.53 - Subtidal seagrass beds	01/06/2018	Unfavourable - No Change	Low

Intertidal rock

Although representing just over 1 percent of the total area of the SAC, intertidal rocky reefs found in the site are important for their high diversity of communities, species richness and high productivity. This habitat supports a wide range of common and rare plant and animal species, including the rare giant goby *Gobius*

cobitis, which has been recorded in shallow pools near Rosemullion Head (Potts *et al.,*1991; Potts and Swaby, 1993), and stalked jellyfish recorded in the Helford (Russel and Selley, 2013). Rocky shores are found in both the Fal and the Helford. In the Helford these shores are largely limited to the mouth of the ria and in the Fal, rocky headlands and outcrops with gullies, overhangs and pools are typical of the area around St Anthony Head (Roberts and Edwards, 1996). Intertidal rocky shores also dominate some areas of shoreline in the Carrick Roads. Differing wave exposures found throughout the site have resulted in the diverse communities present. Classic fucoid algal zonation can be found along the upper reaches of both inlets (Roberts and Edwards, 1996) with rich algal communities present in lower shore rock pools of the Helford. Rich animal communities are also associated with this subfeature within the site and particularly with boulders or overhanging surfaces on the lower shore (Moore *et al.,* 1999).

Condition Assessment: (Natural England, 2020)

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1160 Large shallow inlets and bays	A1 - Intertidal rock	02/03/2020	Unfavourable - No Change	Medium
H1170 Reefs	A1 - Intertidal rock	02/03/2020	Unfavourable - No Change	Medium

Infralittoral rock

Infralittoral rock with kelp forest communities and estuarine bedrock, boulder and cobble communities have been recorded supporting nationally scarce species including the trumpet anemones *Aiptasia mutabilis* (Gainey, 1997), and in the Helford, the ginger tiny anemone *Isozoanthus sulcatus*. Other nationally scarce species include; the scarlet and gold star coral *Balanophyllia regia* and the sea squirt *Phallusia mammillata* (Roberts and Edwards, 1996) which have been recorded in other areas of the SAC, as well as the Devonshire cup coral *Caryophyllia smithii* (Gainey, 1997). This subfeature is present in both estuarine areas and the shallow areas of Falmouth Bay. Kelp forest communities are generally found around the mouth of the Helford and off Pendennis castle, with the main areas of estuarine bedrock and boulder found in the lower estuarine sections of the Fal River. Kelp communities include *Laminaria hyperborea* growing over moderately exposed bedrock fringing the entrance to the Fal, to *Laminaria ochroleuca* found further up the inlet adjacent to St Mawes Castle. *L. ochroleuca* occurs in mixed populations with *L. hyperborea* and *Saccorhiza polyschides* (Howson *et al.,* 2004) while *L. saccharina* and *L. digitata* are found together on shallow sublittoral- fringe bedrock and boulders in the lower Fal (Moore *et al.,*1999). A diverse red algal community has been recorded in association with these kelp species (Howson *et al.,* 2004). The estuarine rock and boulder habitats support similar kelp communities as well as species of foliose red algae and filter-feeding sessile fauna.

Condition Assessment: (Natural England, 2020)

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1130 Estuaries	A3 - Infralittoral rock	01/06/2018	Favourable	Low
H1160 Large shallow inlets and bays	A3 - Infralittoral rock	02/03/2020	Favourable	Low
H1170 Reefs	A3 - Infralittoral rock	02/03/2020	Favourable	Low

Circalittoral rock

The circalittoral rocky reefs of the site are of particular importance for fragile species such as Ross coral *Pentapora foliacea*, the slow growing, long lived, nationally important sea fan *Eunicella verrucosa* and dead man's fingers *Alcyonium digitatum* (Ware and Meadows, 2012; Davies and Sotheran, 1995) Within the Fal and Helford SAC, circalittoral rock is generally restricted to Falmouth Bay. Here a diverse range of habitats have been identified including tide-swept, wave exposed bedrock extending out to the seaward boundary, to more sheltered areas further inshore (Ware and Meadows, 2012). These habitats typically support a range of species including encrusting and cushion sponges, the Devonshire cup coral *Caryophyllia smithii*, and hydroids such as *Nemertesia* spp. (Ware and Meadows, 2012). Mobile species recorded with this biotope include the predatory spiny starfish *Marthasterias glacialis*, edible sea urchin *Echinus esculentus*

and the cotton-spinner sea cucumber *Holothuria forskali* (Ware and Meadows, 2012). The erect bryozoan *Flustra foliacea* and baked bean sea squirt *Dendrodoa grossularia* (on vertical surfaces) have also been recorded (Davies and Sotheran, 1995).

Condition Assessment: (Natural England, 2020)

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1160 Large shallow inlets and bays	A4 - Circalittoral rock	02/03/2020	Unfavourable - No Change	Low
H1170 Reefs	A4 - Circalittoral rock	02/03/2020	Unfavourable - No Change	Low

Maerl beds

The maerl beds within the Fal and Helford SAC are the largest outside of Scotland, Brittany or Ireland. The Fal and Helford maerl bed habitats range from pristine live maerl beds with up to 100% coverage to extensive areas of dead maerl with little to no live maerl. Two species of maerl occur on the site including the nationally scarce *Lithothamnion corallioides* and *Phymatolithon calcareum*.

The live maerl bed at St. Mawes is the largest and probably best known maerl habitat within the SAC. The large bed to the northwest and the smaller bed to the west of Castle Point are dominated by *L. corallioides* with a smaller area of *P. calcareum* found in the centre of the larger, northwest bed (Howson *et al.,* 2004; Allen *et al.,* 2014). Live maerl is also found in a large bed at Helford Passage (Gall, 2014) and throughout Falmouth Bay and Carrick Roads (Allen *et al.,* 2014).

There are extensive areas of dead and crushed maerl, and living maerl overlaying dead maerl found within the site (Howson *et al.,* 2004; Allen *et al.,* 2014), as well as areas of maerl in sediment. These areas of mixed maerl and sediments are comprised of maerl fragments combined with various sediment types including coarse sand, fine sediment, shells and stones. In places, expanses of maerl in sediment form small undulations on the sea floor (Scottish Natural Heritage (SNH), 1994).

Over fifty species of seaweed and many animal species associated with maerl habitats have been recorded at the site, including rare species such as the red algae *Gracilaria multipartita* and Halymenia species, and the rarely recorded Couch's goby *Gobius couchi*. Maerl sediments provide important habitat for a range of species including deep burrowing species, attached seaweed, bivalves and crustaceans (Moore *et al.,* 1999). Infaunal core samples from dead maerl in the Outer Carrick Roads recorded in excess of 230 taxa at genus level (Posford Haskoning, 2004), highlighting that both live and dead maerl habitats support diverse communities.

Condition Assessment: (Natural England, 2020)

Feature	Sub feature name	Assessment date	Feature condition	Confidence
H1130 Estuaries	A5.51 - Maerl beds	02/03/2020	Unfavourable - Declining	High
H1160 Large shallow inlets and bays	A5.51 - Maerl beds	02/03/2020	Unfavourable - Declining	High
H1110 Sandbanks which are slightly covered by sea water all the time	A5.51 - Maerl beds	02/03/2020	Unfavourable - Declining	High

Atlantic salt meadows

The presence of natural saltmarsh within the site is an important natural resource which is rare or non-existent in other estuaries. Examples of saltmarsh vegetation in rias are restricted to south-west England and west Wales. The salt marshes and mudflats form two elements of an interconnected and dynamic system which is vital to the structure and function of the Fal and Helford estuarine river systems (Stapleton *et al.,* 1996).

Within the site there is a narrow zonation, typical of rias, which ranges from low to upper saltmarsh and, in places, transitions further into woodland which is a rare occurrence in the UK. Saltmarsh is found fringing the extremely sheltered upper creeks of both estuaries, however is found more extensively in the Fal. It is present towards the tidal limits of the Fal Ruan creek near Sett Bridge, in Calenick creek, Tresillian River, and on the Helford in the upper reaches of Mawgan creek.

These saltmarsh species support a variety of animals including polychaete worms, crustaceans, and bivalves, the open edges are also ideal nursery areas for young bass and other fish. The patches of saltmarsh within the site are also important areas of feeding, roosting and nesting for wading birds as well as providing a natural form of sea defence (Covey and Hocking, 1987).

Condition Assessment: not included in the current Marine Condition Assessment (Natural England, 2020)

Shore dock

Shore dock is one of the rarest plants in Britain, being known only from the Isles of Scilly, Cornwall, Devon and Wales (Neil *et al.,* 2001). It is a Red List Species (categorised as Endangered), and is listed as a priority species in the UK Biodiversity Action Plan. The populations on the Devon and Cornwall coasts within the Fal and Helford SAC are therefore very important nationally. These populations are also important internationally with shore dock's world status listed as Vulnerable (Neil *et al.,* 2001).

Shore dock occurs in five locations within the SAC: Great Molunan (near St Anthony Head), Raven's Hole (1 km south of Portscatho), Peter's Splash (0.5 km south of Portscatho), Porthbean Beach, and Pendower Beach (McDonnell and King, 2000). At Great Molunan, shore dock occurs on damp rocks below the steep cliffs and on seeping vegetated rocks (McDonnell and King, 2000). Shore dock is found in three sub-sites at Raven's Hole (north, central, and south). Raven's Hole south is typical of shore dock's favoured habitat: a sandy beach backed by well-vegetated cliffs formed of beach head deposits with a freshwater seepage (McDonnell and King, 2000). This type of habitat is also present at the Peter's Splash, Porthbean Beach, and Pendower Beach sites (Neil *et al.,* 2001).

Condition Assessment: not included in the current Marine Condition Assessment (Natural England, 2020)

2.2 Conservation Objectives

The Conservation Objective(s) for the Fal and Helford SAC features are as follows:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

2.3 Sites of Special Scientific Interest

Large areas of intertidal within the Upper Fal are designated as Sites of Special Scientific Interest (SSSIs), these are: Upper Fal Estuary and Woods SSSI and Malpas Estuary SSSI. Saltmarsh within the SAC occurs within the intertidal SSSIs. Intertidal activities within the SSSIs that are included on the SSSI 'Operations requiring Natural England's Consent' (ORNEC) list, formerly the Operations Likely to Damage (OLD) list, would require SSSI consent from Natural England where the activity is undertaken or permitted by a SSSI owner or occupier. Fisheries activities on the ORNEC/ OLD lists for these SSSIs include: 'The killing or removal of any wild animal, including pest control (Ref. 10); 'The introduction of coastal fishing and changes in coastal fishing practice or fisheries management and seafood or marine life collection, including the use of traps or fish cages' (Ref. 16b); 'Bait digging in intertidal areas' (Ref. 18) and 'Use of vehicles or

craft likely to damage or disturb features of interest' (Ref. 26) (Natural England, 2015a; Natural England, 2015b).

3. HRA Process

3.1 Overview of the assessment process

The assessment of commercial fishing activities within the site will be undertaken using a step wise process.

The assessment process comprises of three parts; simple screening, Stage 1 Test for Likely Significant Effect (TLSE) screening and Stage 2 Appropriate Assessment.

3.2 Simple Screening

The simple screening stage was carried out to establish whether an activity occurs within the site and if it does, whether the activity is capable of affecting (other than insignificantly) the designated features of the SAC.

The screening stage is assessed on the following criteria;

1. The activity is capable of affecting (other than insignificantly) either (i) the protected features of an SAC; or (ii) any ecological or geomorphological process on which the conservation of any protected feature of an SAC is (wholly or in part) dependent; and

2. The activity is taking place within or near an area being put forward or already designated as a SAC.

Individual gear types identified in Defra's matrix were assessed and grouped into broad gear types.

3.3 Stage 1 Test for Likely Significant Effect (LSE)

The Test for Likely Significant Effect (LSE) is required by article 6(3) of the Habitats Directive. The aim of the Stage 1 assessment is to assess what potential pressures are exerted on the designated features by the activity and if the pressures are capable of affecting (other than insignificantly) the protected features of the SAC.

The screening of commercial fishing activities in the SAC was undertaken using broad gear type categories as used by Natural England. Sightings data collected by Cornwall IFCA together with officers' knowledge was used to ascertain whether each activity occurs within the site. For these occurring/potentially occurring activities, an assessment of pressures upon the SAC designated features was undertaken using Natural England's Advice on Operations (AoO) (Natural England, 2022).

Fishing activities which were identified as occurring within the site were screened with respect to potential pressures upon designated features. This screening exercise was undertaken using Natural England's AoO for the SAC. This advice provides a broad scale assessment of the sensitivity of designated features to different activity-derived pressures, using nationally available evidence on their resilience (an ability to recover) and resistance (the level of tolerance) to physical, chemical and biological pressures. The assessments of sensitivity to these pressures are measured against a benchmark. It should be noted that these benchmarks are representative of the likely intensity of a pressure caused by typical activities, and do not represent a threshold of an 'acceptable' intensity of a pressure. It is, therefore, necessary to consider how the level of fishing intensity observed within the SAC compares with these benchmarks when screening individual activities.

Due to the broad-scale nature of the sensitivity assessments provided in Natural England's AoO, each pressure is assigned a risk profile based upon the likelihood of the pressure occurring and the magnitude of

the impact should that pressure occur. These risk profiles have been used, together with site-specific knowledge, to identify those pressures which could significantly affect the designated features.

The resultant fisheries activity pressure-feature interactions which have been included for further assessment are included in Section 8. Where there is insufficient evidence on the sensitivity of a designated feature to fishing-related pressures, and these pressures present a risk to designated features, these pressure-feature interactions have been included for further assessment.

Activities were screened out for further Stage 2 assessment if they satisfied one or more of the following criteria:

1. The activity does not occur within the site, does not have the potential to occur and/or is not anticipated to occur in the foreseeable future.

2. The activity does occur but the pressure(s) does not significantly affect/interact with the designated feature(s).

3. The activity does occur but the designated feature(s) is not sensitive to the pressure(s) exerted by the activity.

Fishing activities and their associated pressures which are not screened out in the Stage 1 assessment are then subject to a more detailed Stage 2 assessment.

3.4 Stage 2 Appropriate Assessment

The Appropriate Assessment is required by article 6(3) of the Habitats Directive. The aim of this assessment is to determine whether there is an adverse effect on the integrity of the site in view of the conservation objectives of the SAC.

Each resultant pressure from Section 8 was included and the likelihood of the impacts occurring or the level of exposure to that pressure was considered in Section 9. Mitigation measures were considered and other restrictions and/ or modifications. It was then determined if the pressure would cause an adverse effect on the integrity of the site.

If the Stage 2 assessment is unable to conclude that there is no significant risk of an activity causing an adverse effect on the integrity of the site in view of the conservation objectives of the SAC, then the activity may be subject to management.

4. Interest feature(s) of the EMS categorised as ‘Red’ risk and overview of management measure(s) (if applicable)

A red risk interaction of bottom towed gears and reef features was addressed with the creation of the Cornwall IFCA Closed Areas (European Marine Sites) No 2 Byelaw[5], which prohibits the use of bottom towed fishing gear within the Land’s End, Lizard, Eddystone Reefs, Fal and Helford, and Plymouth Sound areas.

Under Regulation 9 of the Fal Fishery Order 2016 Exclusion Zone 1 restricts fishing to ensure compliance with the Conservation of Habitats and Species Regulations 2017 for seagrass bed communities (see Figure 2).

The southern limit of the Fal Fishery was moved further north from the previous limit as set out in the Truro Port Fishery Regulating Order (1936 amended 1975) to exclude maerl bed communities and seagrass extents from the Fal Fishery Area as set out in the Fal Fishery Order 2016.

[5] More information available from: https://secure.toolkitfiles.co.uk/clients/17099/sitedata/Byelaws%20and%20orders/Cornwall_SFC/Closed-Areas-EMS-byelaw-No-2.pdf [Accessed: 05/08/2022]

5. Fishing activities assessed

This assessment covers the issuing of licences to dredge and hand gather prescribed molluscan bivalves under the Fal Fishery Order 2016 occurring in the Fal Fishery Area within the Fal and Helford SAC site and is part of a suite of assessments for fisheries activities (netting, potting, shore-based activities, diving and pelagic) within the SAC.

All fishing activity/feature interactions at this site identified as 'amber' in the matrix of fisheries gear types and European marine site protected features were considered for inclusion in this assessment. Fishing activity-feature interactions identified as 'green' are also assessed if there are in-combination effects with other activities.

Table 1 shows the fishing activities with amber interactions assessed at this site. The 'matrix gear type' column shows the categories used in the matrix. These are matched to the 'aggregated method' categories used in Natural England conservation advice packages.

Table 1: Fishing activities with amber interactions to be included for assessment

Matrix Gear Type	Natural England Aggregated Method	Feature
Dredges (towed): Oysters	Fishing: Dredges	Intertidal mixed sediments
		Intertidal mud
		Intertidal sand and muddy sand
		Intertidal coarse sediment
		Subtidal mixed sediments
		Subtidal mud
		Subtidal sand
		Subtidal coarse sediment
Intertidal hand work	Fishing: Shore-based activities	Intertidal seagrass beds
		Subtidal seagrass beds
		Intertidal rock
		Infralittoral rock
		Circalittoral rock
		Maerl beds
		Atlantic salt meadows
		Shore dock

Commercial fishing has the potential to vary in nature and intensity over time. This assessment considers activities occurring at the current time.

6. Information about the fishing activities within the site

6.1 Evidence Sources

To determine the levels of fishing activity, the following evidence sources and analyses were used:

- Expert opinion from Cornwall IFCA enforcement and scientific officers
- Cornwall IFCA data from Fal Fishery Order 2016 shellfish catch statistics
- Informal consultation with fishermen

6.2 Fishing activities under consideration

The Fal Oyster Fishery is one of three known remaining wild capture native oyster (*Ostrea edulis*) fisheries in England (Fal, Solent[6] and Thames Estuary) (Long *et al.,* 2017). The Fishery is exploited by hand gathering and hand hauled dredging from non-powered vessels, either haul /tow punts or sailing boats. It is thought to be the last commercial sailing fleet in Europe (Long *et al.,* 2017).

The Fishery is described as a traditional fishery, in that it is restricted to sail or hand-powered vessels. Two types of boat are used for dredging native oysters. The first is the gaff cutter, driven by sail and used in the more open, deeper waters of the estuary. The second is the oyster punt, pulled by hand to drag up oysters in shallower parts of the estuary or in the more open waters during periods of light winds.

There are three recognised methods of collecting oysters from the Fishery. These are explained in more detail below;

6.2.1 Dredging by Sail Boat

Gaff cutters of 18 to 32 ft length on deck try to work the longest lines given the wind conditions on the day (e.g. on a northerly they will work downwind but on a southerly they may use a broad reach to work across the banks) towing two to four dredges usually two per crew member. The dredges are dragged along the seabed and then periodically hauled to the deck by hand and the contents emptied out onto sorting trays known as cultch boards.

The contents are sorted and any marketable/legal oysters or queen scallops are retained. Undersize oysters, queensand dead shell, etc. are returned to the fishery. The dredges vary in size but consist of a triangular metal frame holding the mouth open and a bag attached with the bottom made of iron or steel rings that comes into contact with the seabed and the top is made of net. The weight and size of the dredge is restricted itself to what can be handled by hand. The bags vary in length between 0.5 to 1.0 m and have a width between 0.6 and 1.0 m.

6.2.2 Dredging by Haul /Tow Punt

This is traditionally done with 15 ft open oyster punts with ‘cotton reel’ type hand winches using one dredge and very occasionally two. An anchor is set out attached to the end of the headline and the boat rowed astern (sheaving) paying out the line from one reel.

Once stopped at the end of the headline, the dredge is attached to the warp and is deployed over the stern. The headline winch is then engaged so that the dredge and boat are pulled back towards the anchor. When back at the anchoring point, the dredge warp reel is engaged and the dredge hauled to the surface. The contents are emptied onto the cultch boards and sorted. The process is then repeated. The weight and size of the dredge is restricted itself to what can be handled by hand. The bags vary in length between 0.5 to 1.0 m and have a width between 0.6 and 1.0 m.

6.2.3 Collection by hand

During periods of exceptionally low tides, some licence holders pick oysters, mussels and other shellfish by hand from intertidal areas.

These are expanded upon in more detail below (section 6.3 and section 6.4).

[6] Under the Southern IFCA Solent Dredge Permit Byelaw, Category B Permits are required in order to fish for native oysters. Following the results of the Southern IFCA annual native oyster survey the IFCAs Technical Advisory Committee agreed to close the native oyster beds in the Solent. On this basis, no Category B permits have been issued for the 2021/22 season. Available from: https://www.southern-ifca.gov.uk/solent-dredge-permit-byelaw [Accessed 09/08/2022]

6.3 Existing fisheries management measures

This section relates to current fisheries management relating to the Fal Fishery Order 2016[7].

Oysters have been fished from the estuary since Roman times. The native oyster (*O. edulis*) is now listed as a species "of principle importance for the purpose of conservation of biodiversity" under the Natural Environment and Rural Communities (NERC) Act 2006 and a UK Biodiversity Action Plan (UKBAP) Priority Species. It is also on the OSPAR List of Threatened and/or Declining Species and Habitats (Region II – Greater North Sea and Region III – Celtic Sea).

The Fishery was previously regulated by the Port of Truro under the Truro Port Fishery Regulating Order (1936 amended 1975) which expired on the 31st July 2014. Since the expiry of the Truro Port Fishery Order in 2014 and the subsequent temporary legislative measures, the Fishery is now managed by Cornwall IFCA under the Fal Oyster Fishery 2016 Regulating Order.

As Grantee of the Regulating Order, Cornwall IFCA has a responsibility for monitoring and managing the stocks of oysters within the Fishery. Monitoring is achieved through annual dredge surveys and monthly catch statistics submitted by all licence holders. Dredge surveys are conducted by Cornwall IFCA in January and describe the catch rates and distribution of native oysters within the Fishery at the time of survey.

6.3.1 Regulations

The Fal Fishery Order 2016 manages the fishery by setting regulations that control the effort directed to the fishery and a number of technical measures[8].

- A licence needs to be issued by the Authority to dredge, fish for or take oysters or mussels in the Fishery area.
- Dredging can only be carried out by a fishing boat powered by sails or oars; or using a winch or other device which can only be operated by hand.
- A dredge must not incorporate any teeth, tines or other digging projections; exceed 20 kg or exceed overall width of 1.2 m.
- No dredge to be used during the closed season (1st April to 30th September). Dredges are permitted between 1st October and 31st March each year.
- During the closed season (1st April to 30th September) dredges can fish for or take oysters over an oyster lay area only if outside the excluded period (14th of May to 4th of August). Anyone wishing to dredge for oysters on a recognised lay area outside the fishing season is required to give advance notice to Cornwall IFCA.
- Sixteen oyster lay areas within the Fal Fishery limits are defined in the Regulations[8]
- No dredges can be used in Exclusion Zone 1
- The hours of fishing are restricted to between 0900 and 1500 (local time) daily Monday to Friday and between 0900 and 1300 (local time) on Saturdays. Fishing is not permitted on Sundays.
- Year-round intertidal hand gathering of bivalve and gastropod species by license holders is permitted while the dredge is not in use. It is however, an offence under the Shellfish Act 1967 to sell native oysters between 14th of May and the 4th of August in any year.
- Licence holders must provide monthly catch statistics to the Authority.
- The removal of oysters from the fishery is only permitted if the native oysters do not pass through a circular aperture of 67 mm diameter when the shell is laid flat across the aperture. Any native oyster that passes through a circular aperture 67 mm in diameter should be returned to the sea immediately.
- The minimum length for mussels is 50 mm.
- There is no minimum size for Pacific oysters and if caught they must not be returned alive to the Fishery.

[7] The Fal Fishery Order 2016 available from: https://www.legislation.gov.uk/uksi/2016/716/made [Accessed: 05/08/2022]

[8] More details on the Regulations under the Fal Fishery Order 2016 can be found here: https://secure.toolkitfiles.co.uk/clients/17099/sitedata/Fal_Fishery/2017-Regulations-under-the-FFO-2018-09-04-161532.pdf [Accessed: 05/08/2022]

Enforcement of the above conditions within the Regulating Order is undertaken by officers from Cornwall IFCA. Management of the fishery is overseen by Cornwall IFCA through the Fal Fishery Management Committee (FFMC). The FFMC is comprised of licensees, relevant stakeholders, Natural England, Cornwall IFCA and other relevant regulators.

6.3.2 Limits of the Fishery

The Fishery only operates within the boundaries shown in Figure 1. The area is based upon the boundary for the previous Truro Port Fishery Regulating Order but the southern boundary has been amended to remove the areas of maerl and seagrass which were previously within the fishery and includes the Fal Fishery Exclusion Zone 1 (Figure 2).

Oyster lay areas are defined in the Regulations[7]. After fishermen have initially harvested the shellfish, they sometimes move the shellfish to shallow beds in adjacent rivers and creeks of the Fal River into areas which are commonly referred to as lays. This is done to manage peaks in supply and to ensure a safe product is being supplied under the hygiene requirements.

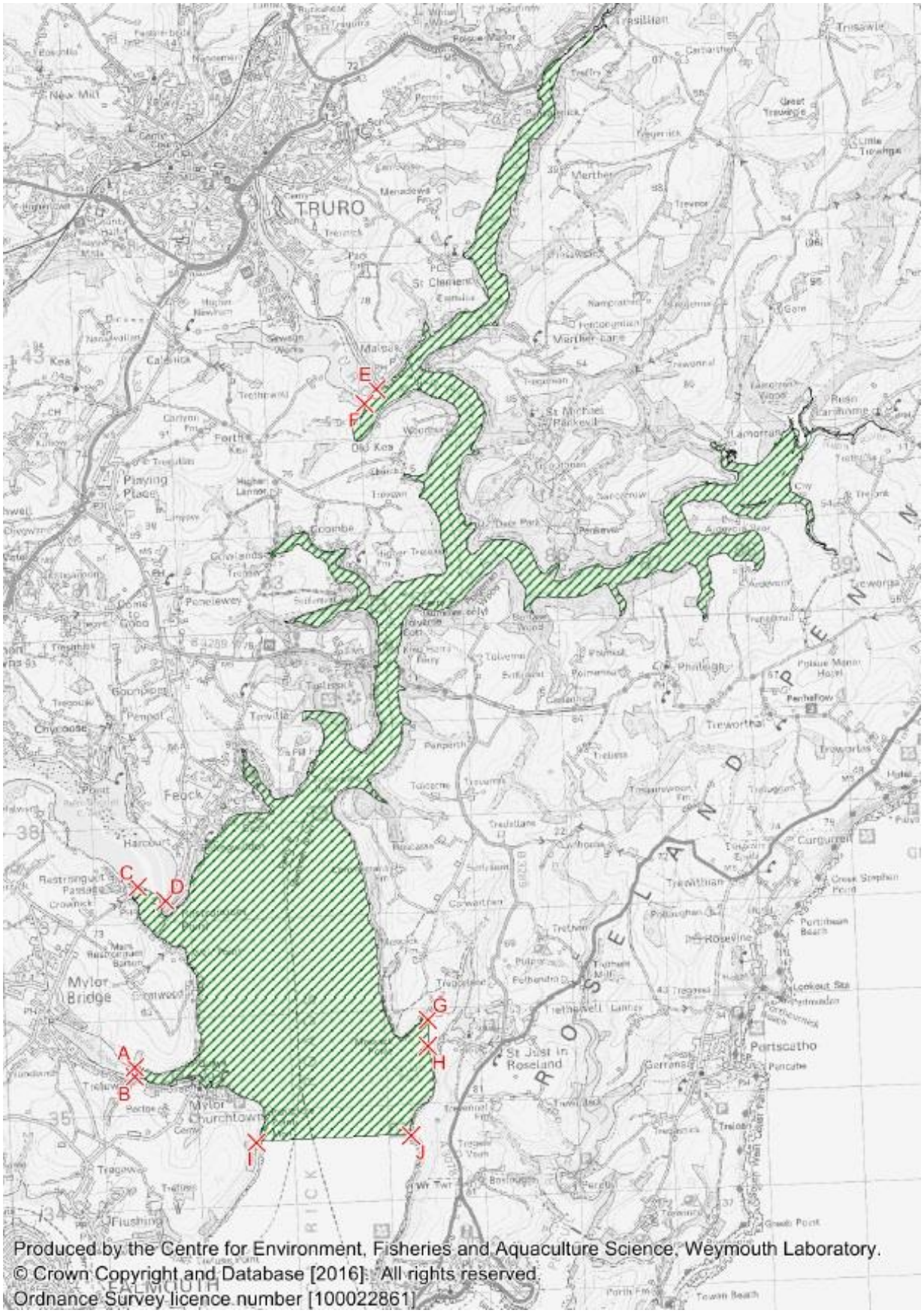

Figure 1: Fal Fishery Order 2016 area boundary within the River Fal.

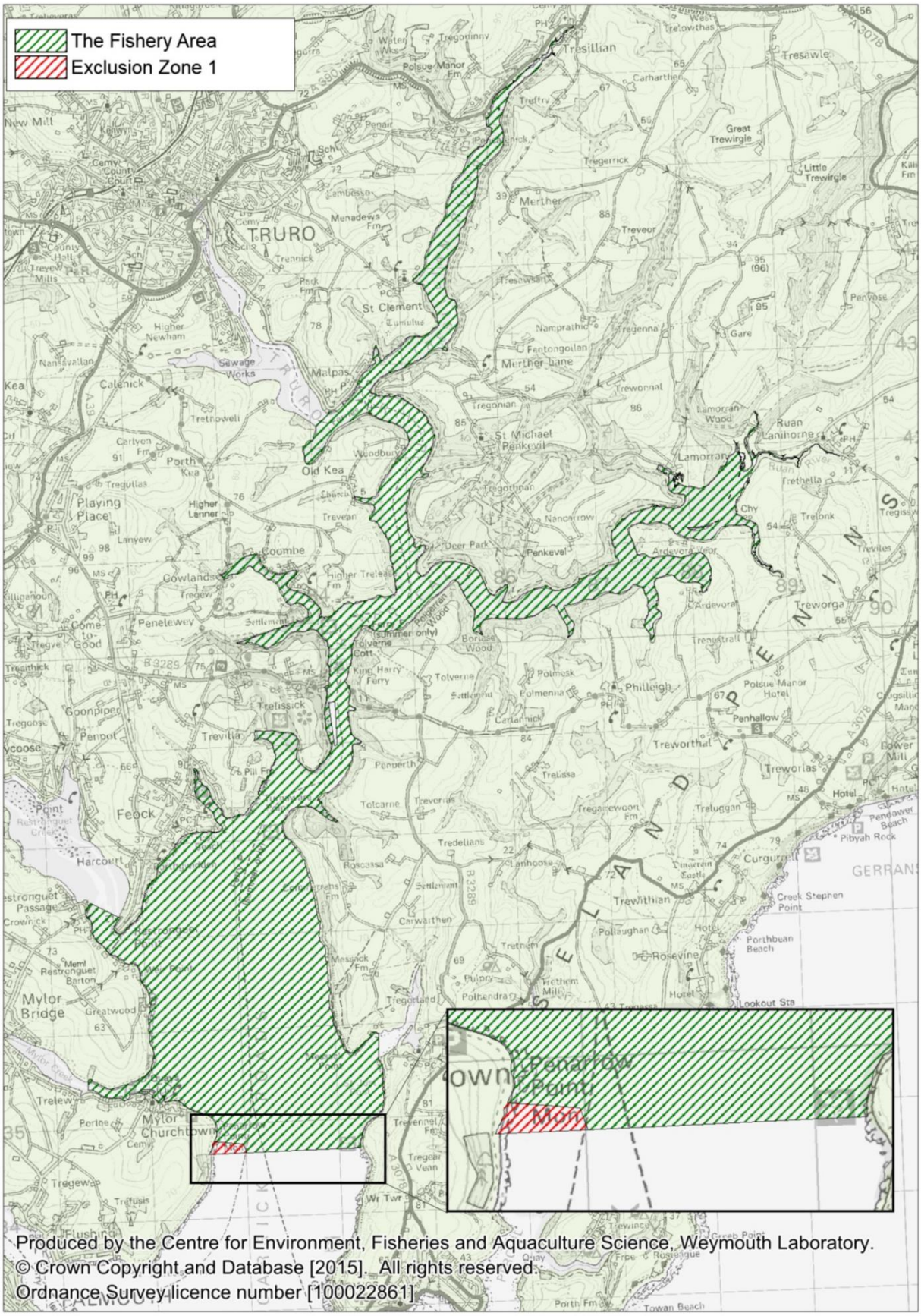

Figure 2: Fal Fishery Order 2016 area boundary and Exclusion Zone 1 within the River Fal.

The Fishery is split into three management areas A, B and C (Figure 3). The monthly catch statistics are reported by area fished. Areas A and B cover the area from the southern boundary of the fishery to Turnaware Point and are fished predominantly by sail and Area C covers the area from Turnaware Point to Malpas and is fished by oyster punts using haul /tow methods.

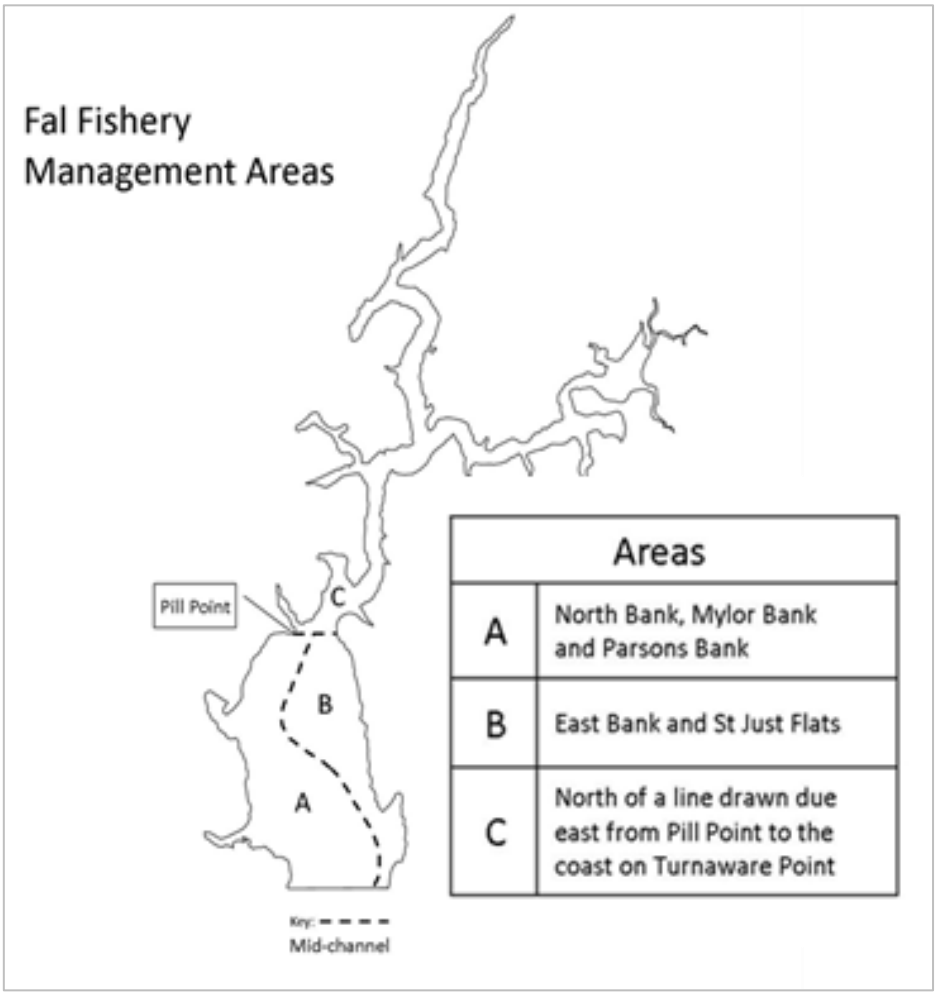

Figure 3: Fal Fishery Management Areas

6.3.3 Licensing of Fishery

No person is permitted to dredge, fish for or take, within the limits of the fishery, shellfish except under the authority of a licence issued by Cornwall IFCA. A licence can only be used by the named licence holder and are issued seasonally.

For the 2022-2023 Season, Cornwall IFCA issued 43 dredge and hand gathering licences, representing 28 licence holders (Table 2). These licences are used by a total of 16 sail boats, 23 haul /tow punts and 1 hand-gatherer (12 licence holders use both sail and punts).

Table 2: Total number of Fal Fishery licences issued by Cornwall IFCA from 2014-15 to 2021-22

Season	Number of licence holders (persons)	Number of dredge licences issues	Number of hand gathering only licences issues	Total licences issued
2014/15	34	57	1	58
2015/16	32	53	1	54
2016/17	35	59	3	62
2017/18	41	62	3	65
2018/19	37	59	1	60
2019/20	33	49	1	50
2020/21	30	44	1	45
2021/22	28	42	1	43

The number of dredges is not capped but applications for dredges fluctuate annually in line with available stocks within the fishery (Table 3).

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Table 3: Fal Fishery dredge licences issued since 1951-52 to 2021-22

Season	Number of Dredge Licences Issues	Season	Number of Dredge Licences Issued	Season	Number of Dredge Licences Issued	Season	Number of Dredge Licences Issued
1951/52	85	1970/71	76	1989/90	16	2007/08	50
1952/53	90	1971/72	63	1990/91	19	2008/09	52
1953/54	92	1972/73	45	1991/92	14	2009/10	51
1954/55	No data	1973/74	43	1991/92	14	2010/11	45
1955/56	124	1974/75	56	1992/93	26	2011/12	39
1956/57	107	1975/76	85	1993/94	33	2012/13	55
1957/58	97	1976/77	88	1994/95	32	2012/13	55
1958/59	101	1977/78	119	1995/96	44	2013/14	53
1959/60	96	1978/79	140	1996/97	87	2014/15	57
1960/61	69	1979/80	146	1997/98	87	2015/16	53
1961/62	36	1980/81	151	1998/99	78	2016/17	59
1962/63	No data	1981/82	105	1999/00	70	2017/18	62
1963/64	No data	1982/83	16	2000/01	69	2018/19	59
1964/65	55	1983/84	24	2001/02	69	2019/20	49
1965/66	70	1984/85	No data	2002/03	77	2020/21	44
1966/67	69	1985/86	35	2003/04	67	2021/22	42
1967/68	84	1986/87	25	2004/05	43		
1968/69	87	1987/88	31	2005/06	41		
1969/70	87	1988/89	22	2006/07	46		

6.3.4 Changes to the Regulations of the Fal Fishery Order 2016:

Changes to the Regulations made under the Fal Fishery Order 2016 were made in 2017 where by-catch restrictions for bivalve or gastropod species were removed. Previously by-catch species could not exceed 20% of the weight of native oysters or mussels retained on board. Since the season of 2016-2017 and the changes of the Regulations a market has developed for queen scallops, locally referred to as *queenies*. They have been recorded on the statistical returns forms as ‘queens’. Cornwall IFCA officers believe the species identified to primarily be the variegated scallop (*Mimachlamys varia*) as opposed to the more commonly referred to queen scallop (*Aequipecten opercularis*) (Jenkin *et al*., 2020). For simplicity the term ‘queen scallop’ has been used to describe this species for the entirety of the HRA.

6.3.5 Cornwall IFCA surveys

Cornwall IFCA will continue to complete an annual oyster survey to assess potential recruitment to the fishery and catch rates of fishable stock. The survey method will follow that used in previous surveys so comparisons can be drawn. Since 2016 the abundance and distribution of queen scallops has been included. Additionally, habitat surveys are undertaken to assess the condition of the features of the SAC within the boundary of the Regulating Order. Additional research will be commissioned to inform the ongoing management regime and to support the actions of the management committee.

Cornwall IFCA have produced annual reports of the oyster surveys, the most recent report can be found on the Cornwall IFCA website[9].

[9] Fal Oyster Fishery survey reports available from: https://www.cornwall-ifca.gov.uk/Research_Environment [Accessed: 05/08/2022]

6.4 Scale of the activities

Licence holder returns data

Regulations under the Fal Fishery Order 2016 require licence holders to submit monthly catch statistics to the Authority[10]. Below is a summary of the catch statistics from seasons 2014-15 through to 2021-22. The full analysis methodology can be seen in Sturgeon *et al.,* (2021) and previous analysis of licence holder returns statistics of the Fal Oyster Fishery for past seasons can be found on the Cornwall IFCA website[11]. The season totals (October to September) of hand gathering and lay areas for 2021-2022 are not yet complete and therefore are only calculated for October to March. Compliance with submission of monthly catch statistics at the time of writing this HRA (August 2022) was 86% for October 2021 to March 2022. The remaining 14% of missing returns from licence holders will be submitted by the end of the season (September 2022).

6.4.1 Overall Statistics

The weight of all shellfish removed from the Fishery for the past seven seasons is presented in Table 4. For 2021-22 it is only calculated for October 2021 to March 2022 as the data for the remainder of the season (September 2022) is not available.

Table 4: Season (October to September) totals of landed shellfish (kg) for the whole Fal Fishery, dredge and hand gathered (including all data submitted, no removals for lack of attribute data). * Excludes weight of native oysters removed and placed onto lays. N.B. ' –' denotes where data was not recorded.

Season	*Native Oysters (kg)	Mussels (kg)	Queen Scallops (kg)	Scallops (kg)	Pacific Oysters (kg)	Cockles (kg)	Winkles (kg)	Whelks (kg)
2014-2015	90,641	14,767	1,047	359	-	36	:-	-
2015-2016	67,595	10,811	180	33	-	86	-	-
2016-2017	68,341	20,626	7,078	525	50	60	-	-
2017-2018	50,220	22,069	71,488	704	725	64	1,642	0
2018-2019	36,076	4,443	82,335	843	2,101	225	702	20
2019-2020	19,244	1,840	91,731	1,038	10,213	0	594	0
2020-2021	12,332	686	87,876	331	492	0	639	0
2021-2022 **(Oct to Mar)**	13,083	1,217	64,652	206	135	0	453	0

6.4.2 Hand gathering

The totals of shellfish landed by hand gathering can be seen in Table 5. Hand gathering hours directed towards oysters and mussels can be seen in Table 6.

Table 5: Season totals (October to September) of landed shellfish (kg) by hand gathering in the Fal Fishery. *Excludes weight of native oysters removed and placed onto lays. N.B. ' –' denotes where data was not recorded.

Season	Hand gathering Hours	*Native Oysters (kg)	Mussels (kg)	Queen Scallops (kg)	Scallops (kg)	Pacific Oysters (kg)	Cockles (kg)	Winkles (kg)	Whelks (kg)
2016-2017	330	4,256	6,443	13	0	0	1	-	-
2017-2018	842	3,588	20,518	5	241	455	0	225	0
2018-2019	375	1,934	3,674	167	0	1,538	50	126	0
2019-2020	141	881	1,228	50	0	10,199	0	230	0
2020-2021	60	382	349	0	0	232	0	0	0
2021-2022 **(Oct to Mar)**	116	569	800	80	0	37	0	260	0

[10] Fal Fishery catch statistics form available from: https://www.cornwall-ifca.gov.uk/fal-fishery [Accessed: 05/08/2022]
[11] Fal Oyster Fishery permit statistics reports available from: https://www.cornwall-ifca.gov.uk/Research_Environment [Accessed: 05/08/2022]

Table 6: Total weight of native oysters (kg's) and mussels (kg's) removed from the Fishery by hand gathering each season (October to September), total hand gathering hours and Landings Per Unit Effort (LPUE) (kg oysters or mussels/ hand gathering hours). * Excludes weight of native oysters removed and placed onto lays.

Season	Native oysters			Mussels		
	Hand gathering Hours	*Native Oysters landed (kg)	LPUE (kg oysters/ hour fished)	Hand gathering Hours	Mussels landed (kg)	LPUE (kg mussels/ hour fished)
2016-2017	100	946	9.43	214	6,243	29.17
2017-2018	260	3,588	13.79	570	20,518	36.00
2018-2019	107	1,934	18.12	130	3,674	28.26
2019-2020	53	881	16.78	40	1,228	30.51
2020-2021	26	382	14.70	15	349	23.27
2021-2022 **(Oct to Mar)**	50	569	11.50	27	800	29.63

6.4.3 Dredging

The totals of all shellfish species landed by dredging from October to March can be seen in Table 7 and Landings Per Unit Effort (LPUE) of native oysters and queen scallops can be seen in Table 8.

Table 7: Season totals (October to March) of landed shellfish (kg) by dredging in the Fal Fishery. * Excludes weight of native oysters removed and placed onto lays. N.B. ' –' denotes where data was not recorded.

Season	Fishing Hours	Dredge Hours	*Native Oysters (kg)	Mussels (kg)	Queen Scallops (kg)	Scallops (kg)	Pacific Oysters (kg)	Cockles (kg)	Winkles (kg)	Whelks (kg)
2014-2015	7,605	15,728	87,298	1,322	1,047	359	-	36	-	-
2015-2016	7,638	14,068	66,023	1,290	140	33	-	86	-	-
2016-2017	8,239	15,170	56,792	3,604	4,040	117	0	10	-	-
2017-2018	7,785	17,234	44,605	414	69,220	462	151	64	381	-
2018-2019	6,907	16,545	30,896	359	74,472	841	318	175	469	20
2019-2020	5,271	11,897	16,491	419	71,408	1,008	14	0	220	0
2020-2021	5,271	10,845	11,550	282	85,721	231	60	0	375	0
2021-2022	4,841	9,619	12,435	417	63,152	170	98	0	73	0

Table 8: Total weight of native oysters and queen scallops (kg's) removed from the Fishery by dredging each season (October to March) total dredge hours and Landings Per Unit Effort (LPUE) (kg oysters or queen scallops/dredge hours). * Excludes weight of native oysters removed and placed onto lays.

Season	Dredge Hours	*Native Oysters (kg)	LPUE (kg oysters/ dredge hour)	Queen Scallops (kg)	LPUE (kg queens/ dredge hour)
2014-2015	15,728	87,298	5.55	1047	0.07
2015-2016	14,068	66,023	4.69	140	0.01
2016-2017	15,170	56,792	3.74	4,040	0.27
2017-2018	17,234	44,605	2.59	69,220	4.01
2018-2019	16,545	30,896	1.87	74,472	4.50
2019-2020	11,897	16,491	1.39	71,408	6.00
2020-2021	10,845	11,550	1.06	85,721	7.90
2021-2022	9,619	12,435	1.29	63,152	6.57

Slipper limpets (*Crepidula fornicata*), a non-native species, are also removed from the fishery by licence holders and the total weight removed can be seen in Table 9.

Table 9: Total weight of slipper limpets (kg) removed from the Fal Fishery by dredging between October to March each season.

Season	**Slipper limpets removed (kg's)**
2014-2015	5,111
2015-2016	2,363
2016-2017	1,863
2017-2018	2,429
2018-2019	2,497
2019-2020	1,045
2020-2021	1,391
2021-2022	861

6.4.4 Lays

The weight of native oysters fished (by both dredging and hand gathering) and placed on lay areas were kept separate as these remained within the Fishery. The total weight of native oysters placed onto lays can be seen in Table 10.

Table 10: Total weight of native oysters (kg) placed on and removed from lay areas in the Fal Fishery, dredge and hand gathered, between October to September each season.

Season	Total native oysters **placed on** lays (kg)	Total native oysters **removed from** lays (kg)
2014-2015	15,377	20,594
2015-2016	2,758	5,590
2016-2017	6,641	7,818
2017-2018	11,268	5,103
2018-2019	11,329	4,074
2019-2020	7,444	5,294
2020-2021	8,687	4,413
2020-2021 **(Oct to Mar)**	3,447	1,105

7. Simple screening

7.1 Simple screening results

Table 11 shows the results of the simple screening phase. Annex 3 indicates if the specified fishing activity is taking place, and which other fishing activities are taking place. The full list of fisheries activities occurring has been included for the 'in-combination' assessment.

For the specified fishing activity, the following questions were asked:

- Is the activity capable of affecting the features of the SAC? (Table 11)

Table 11 indicates if the specified fishing activity is capable of affecting the designated features of the SAC by using the risk ratings from the fisheries in European marine sites matrix.

Interactions are defined as;
Red Interaction: Where it is clear that the conservation objectives for a feature (or sub-feature) will not be achieved because of its sensitivity to a type of fishing, - irrespective of feature condition, level of pressure, or background environmental conditions in all EMSs where that feature occurs - suitable management measures will be identified and introduced as a priority to protect those features from that fishing activity or activities.

Amber Interaction: Where there is doubt as to whether conservation objectives for a feature (or sub-feature) will be achieved because of its sensitivity to a type of fishing, in all EMSs where that feature occurs, the effect of that activity or activities on such features will need to be assessed in detail at a site specific level. Appropriate management action should then be taken based on that assessment.

Green Interaction: Where it is clear that the achievement of the conservation objectives for a feature is highly unlikely[12] be affected by a type of fishing activity or activities, in all EMSs where that feature occurs, further action is not likely to be required, unless there is the potential for *in combination* effects[13].

Blue interaction: For gear types where there can be no feasible interaction[14] between the gear types and habitat features, a fourth categorisation of blue is used, and no management action should be necessary.

[12] In theory, Green and Amber categories exist along a continuum of risk, for example it is theoretically possible for what is widely recognised to be a benign activity to cause a significant impact on a feature, if carried out at extremely high levels. As result, an assumption has been made that activities categorised as Green are assumed to have no impact on the feature or sub-feature at current maximum levels of commercial fishing effort, to be re-evaluated if conditions change.
[13] In other words, where a type of fishing activity which on its own would not affect the achievement of conservation objectives for the feature, but which in combination with other activities might do so.
[14] On this basis – where there is a feasible (even if unlikely) interaction, activities will be categorised as Red or Amber or Green by Cornwall IFCA.

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Table 11: Result of simple screening for gear/feature interactions (A = Amber, B = Blue, R = Red)

Activity/Feature Interaction	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock
Dredges (towed): oysters	A	A	A	A	A	A	A	A	R	R	R	R	R	R	A	A
Hand working (access from vessel)	A	A	A	A	B	B	B	B	R	R	A	B	B	B	A	A
Hand working (access from land)	A	A	A	A	B	B	B	B	R	R	A	B	B	B	A	A

- Does the activity take place within the SAC? (Section 6 and Annex 3)

  Yes: Dredges (towed): oysters and Intertidal activities: hand working

Any fishing activities indicated as not taking place in the SAC and not likely to occur in the future have been excluded from further assessment.

- Stage 1 (Test for LSE) assessment necessary?

  Yes: Dredges (towed): oysters and Intertidal activities: hand working

  (Green, Amber or Red interactions only for activities which are or might be taking place within the SAC, no further assessment necessary if a Blue interaction as no interaction)

8. Test for Likely Significant Effect (LSE)

The Habitats Regulations assessment (HRA) is a step-wise process and is first subject to a coarse test of whether a plan or project will cause a likely significant effect on an EMS[15]. The assessment of LSE is shown in Table 12 to Table 15.

For the specified fishing activity, the following questions were asked:

1.	Is the activity/activities directly connected with or necessary to the management of the site for nature conservation?	No
2.	What are the potential pressures exerted by the activity on the feature and is the feature potentially exposed to the pressure(s)?	Dredges: oysters Table 12 Hand working Table 14
3.	What are the potential effects/impacts of the pressure(s) on the feature and is there a LSE?	Dredges: oysters Table 13 Hand working Table 15

Table 13 and Table 15 show the results of the LSE stage, which identifies the potential pressures. To determine whether each pressure is capable of affecting (other than insignificantly) the site's feature(s), the sensitivity assessments and risk profiling of pressures from the advice on operations section of the Natural England conservation advice package were used. This includes ecological or geomorphological processes on which the conservation of any protected feature of the SAC is (wholly or in part) dependent.

Table 13 and Table 15 show the potential impacts that the pressures identified in Table 12 and Table 14 could have on the designated features of the SAC.

[15] Managing Natura 2000 sites: http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm

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Table 12: Potential pressures for oyster dredging fishing activities (Aggregated fish method: Dredges) for the features of the Fal and Helford SAC (Key: S = Sensitive, NS = Not Sensitive, IE = Insufficient Evidence, NA = Not Assessed, greyed out = Not Relevant)

Pressures/Features	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	Screening justification	Risk profile
Abrasion/disturbance of the substrate on the surface of the seabed	S	S	S	NS	S	S	S	S	S	S	S	S	S	S			IN	Medium to High
Changes in suspended solids (water clarity)	S	S	S	NS	S	S	S	S	S	S	S	S	S	S			IN	Medium to High
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	S	S	S	NS	S	S	S	S	S	S	S	S	S	S			IN	Medium to High
Removal of non-target species	S	S	S		S	S	S	S	S	S	S	S	S	S	S		IN	Medium to High
Removal of target species	S	S	S		S	S	S	S	S	S		S	S				IN	Medium to High
Smothering and siltation rate changes (Light)	S	S	S	NS	S	S	S	S	S	S	S	S	S	S			IN	Medium to High
Visual disturbance			NS		NS	NS	NS				NS	NS	NS				OUT	Medium to High
Deoxygenation	S	NS	S	NS	S	S	S	S	NS	NS	S	S	S	S	NS		IN	Low
Hydrocarbon & PAH contamination	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		OUT	Low
Introduction of light	IE	NS	S		IE	NS	S	S	S	S	S	S	IE	S			IN	Low
Introduction of microbial pathogens	S	S	S		S	S	S	S	S	S	S	S	S	IE	S		IN	Low
Introduction or spread of invasive non-indigenous species (INIS)	S	S	S		S	S	S	S	S	S	S	S	S	S			IN	Low
Litter	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	S		IN	Low
Nutrient enrichment	NS	NS	NS	NS	NS	NS	NS	NS	S	S	IE	NS	NS	NS	NS		IN	Low
Organic enrichment	NS	NS	NS	NS	S	S	S	S	S	S	S	S	S	S	NS		IN	Low
Physical change (to another seabed type)											S	S	S				IN	Low
Physical change (to another sediment type)	S	S	S	S	S	S	S	S	S	S				NS			IN	Low
Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		OUT	Low
Transition elements & organo-metal (e.g. TBT) contamination	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		OUT	Low
Underwater noise changes					NS	NS	NS				IE		NS				OUT	Low

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The associated impacts of the potential pressures are identified as shown in Table 13 (Natural England, 2022);

Table 13: Summary of pressures that are capable of affecting the protected features of the SAC (Aggregated fish method: Dredges)

Pressure	**Potential Impact**	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	**Appropriate assessment necessary?** [16]
Abrasion/ disturbance of the substrate on the surface of the seabed	The pressure results where the gear makes contact with the seafloor. The area affected is determined by the footprint of the gear and the amount of movement across the seabed. The different gear components will make variable contributions to the total physical disturbance of the seabed and its associated biota, and hence the pressure will vary according to factors such as gear type, design/modifications, size and weight, method of operation (including towing speed) and habitat characteristics (e.g. topography) (Lart, 2012; Suuronen *et al.,* 2012; Polet and Depestele, 2010). Towed bottom fishing gears are used to catch species that live in, on or in association with the seabed and therefore are designed to remain in close contact with the seabed. That interaction with the seabed can lead to disturbance of the upper layers of the seabed (e.g. see pressures 'Siltation rate changes (low'), 'Changes in suspended solids'); direct removal (e.g. see pressures 'Removal of target species', 'Removal of non-target species'), damage, displacement or death of the benthic flora and fauna; short-term attraction of scavengers; and the alteration of habitat structure (e.g. flattening of wave forms, removal of rock, removal of structural organisms) (Sewell and Hiscock, 2005; Kaiser *et al.,* 2002; Kaiser *et al.,* 2001; Collie *et al.,* 2000; Gubbay and Knapman, 1999). Due to their penetrative nature and close contact with the seabed, scallop dredges cause																	Yes

[16] The pressure-feature interactions were included for assessment in Stage 2 if:
the feature is exposed to the pressure, or is likely to be in the future; and
the pressure is capable of affecting (other than insignificantly) the feature; or
it is not possible to determine whether the pressure is capable of affecting (other than insignificantly) the feature.

Pressure	Potential Impact	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	Appropriate assessment necessary? [16]
	substantial physical disruption to the seafloor by ploughing sediments and damaging organisms. The Newhaven dredges used by the UK king scallop fishery are likely to be one of the most damaging types of scallop dredge due to the effect of their long teeth, which can penetrate 3-10 cm into the seabed (Howarth and Stewart, 2014; Hinz *et al.,* 2012). The magnitude of the immediate response to fishing disturbance, cumulative effects and recovery times varies significantly according to factors such as the type of fishing gear and fishing intensity, the habitat and sediment type, levels of natural disturbance and among different taxa (Boulcott *et al.,* 2014; Hinz *et al.,* 2009; Kaiser *et al.,* 2006; Kaiser *et al.,* 2001; Collie *et al.,* 2000).																	
Changes in suspended solids (water clarity)	This pressure may result from physical disturbance of the sediment, along with hydrodynamic action caused by the passage of towed gear, leading to entrainment and suspension of the substrate behind and around the gear components (Lart, 2012; Dale *et al.,* 2011; O'Neill and Summerbell, 2011; O'Neill *et al.,* 2008; Sewell *et al.,* 2007; Kaiser *et al.,* 2002; Gubbay and Knapman, 1999; Riemann and Hoffmann, 1991). The quantity of suspended material and its spatial and temporal persistence will depend on factors associated with the gear (such as type/design, weight, towing speed), sediment (particle size, composition, compactness), the intensity of the activity and the background hydrographic conditions (Dale *et al.,* 2011; O'Neill and Summerbell, 2011; Sewell *et al.,* 2007; Kaiser *et al.,* 2002). Turbid plumes can reduce light levels and smother feeding and respiratory organs. Prolonged exposure to the pressure may result in changes in sediment composition through suspension and transport of finer material. There are also concerns over resuspension of phytoplankton cysts and copepod eggs (O'Neill and Summerbell, 2011; Sewell *et al.,* 2007; Kaiser *et al.,* 2002; Kaiser *et al.,* 2001; Gubbay and Knapman, 1999). Further																	Yes

Pressure	Potential Impact	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	**Appropriate assessment necessary?** [16]
	effects are also considered under the pressures: Deoxygenation, Nutrient enrichment and Organic enrichment.																	
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	The pressure results where the gear makes contact with the seafloor. The area affected is determined by the footprint of the gear and the amount of movement across the seabed. The different gear components will make variable contributions to the total physical disturbance of the seabed and its associated biota, and hence the pressure will vary according to factors such as gear type, design/modifications, size and weight, method of operation (including towing speed) and habitat characteristics (e.g. topography) (Lart, 2012; Suuronen *et al.,* 2012; Polet and Depestele, 2010). Towed bottom fishing gears are used to catch species that live in, on or in association with the seabed and therefore are designed to remain in close contact with the seabed. That interaction with the seabed can lead to disturbance of the upper layers of the seabed (e.g. see pressures 'Siltation rate changes (low'), 'Changes in suspended solids'); direct removal (e.g. see pressures 'Removal of target species', 'Removal of non-target species'), damage, displacement or death of the benthic flora and fauna; short-term attraction of scavengers; and the alteration of habitat structure (e.g. flattening of wave forms, removal of rock, removal of structural organisms) (Sewell and Hiscock, 2005; Kaiser *et al.,* 2002; Kaiser *et al.,* 2001; Collie *et al.,* 2000; Gubbay and Knapman, 1999). Due to their penetrative nature and close contact with the seabed, scallop dredges cause substantial physical disruption to the seafloor by ploughing sediments and damaging organisms. The Newhaven dredges used by the UK king scallop fishery are likely to be one of the most damaging types of scallop dredge due to the effect of their long teeth, which can penetrate 3-10 cm into the seabed (Howarth and Stewart, 2014; Hinz *et al.,* 2012). The magnitude of the immediate response to fishing																	Yes

Pressure	Potential Impact	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	Appropriate assessment necessary? [16]
	disturbance, cumulative effects and recovery times varies significantly according to factors such as the type of fishing gear and fishing intensity, the habitat and sediment type, levels of natural disturbance and among different taxa (Boulcott *et al.,* 2014; Hinz *et al.,* 2009; Kaiser *et al.,* 2006; Kaiser *et al.,* 2001; Collie *et al.,* 2000).																	
Removal of non-target species	Bycatch (i.e. discarded catch) is associated with almost all fishing activities and is related to factors such as the gear type and its design (i.e. its selectivity), the targeted species and effort. There are significant concerns over the impacts of discards on marine ecosystems, including changes in population abundance and demographics of affected species and altered species assemblages and food web structures (Kaiser *et al.,* 2001; Alverson *et al.,* 1994). However, discards also provide important food resources for some scavenging species, including seabirds (Heath *et al.,* 2014; Jennings and Kaiser, 1998). Dredging can result in bycatch of fish, crustaceans and other invertebrates, turtles and even marine mammals (Craven *et al.,* 2013; Hinz *et al.,* 2012; NOAA Fisheries, 2012; Sewell and Hiscock, 2005; Gubbay and Knapman, 1999). Of all the fishing gears, scallop dredges are considered to be the most damaging to non-target benthic communities (Howarth and Stewart, 2014).																	Yes
Removal of target species	Dredges are used to collect a variety of shellfish species. Examples of species that can be directly removed from intertidal and subtidal habitats as result of a targeted fishery include oysters (*Ostrea edulis*), mussels (*Mytilus edulis*), scallops (*Pecten* spp.), cockles (*Cerastoderma edule*), and razor clams (*Ensis* spp.). These may themselves be features/sub-features of designated sites (e.g. mussel beds/oyster beds/biogenic reefs), or may be species forming part of the biotope (e.g. bivalves in sediment features) or wider community composition associated with the																	Yes

Pressure	Potential Impact	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	Appropriate assessment necessary? [16]
	designated feature (Joint Nature Conservation Council (JNCC) and Natural England (NE), 2011; Sewell and Hiscock, 2005; Gubbay and Knapman, 1999).																	
Smothering and siltation rate changes (Light)	This pressure may result from physical disturbance of the sediment, along with hydrodynamic action caused by the passage of towed gear, leading to entrainment and suspension of the substrate behind and around the gear components and subsequent siltation (Lart, 2012; Dale *et al.,* 2011; O'Neill and Summerbell, 2011; O'Neill *et al.,* 2008; Sewell *et al.,* 2007; Kaiser *et al.,* 2002; Gubbay and Knapman, 1999; Riemann and Hoffmann, 1991). The quantity of suspended material, its spatial and temporal persistence and subsequent patterns of deposition will depend on factors associated with the gear (such as type/design, weight, towing speed), sediment (particle size, composition, compactness), the intensity of the activity and the background hydrographic conditions (Dale *et al.,* 2011; O'Neill and Summerbell, 2011; Sewell *et al.,* 2007; Kaiser *et al.,* 2002). Sediment remobilisation and deposition can affect the settlement, feeding, and survival of biota through smothering of feeding and respiratory organs. Prolonged exposure of an area to the pressure may result in changes in sediment composition (O'Neill and Summerbell, 2011; Sewell *et al.,* 2007; Kaiser *et al.,* 2002; Kaiser *et al.,* 2001; Gubbay and Knapman, 1999). Further effects are also considered under the pressures: Deoxygenation, Nutrient enrichment and Organic enrichment.																	Yes
Deoxygenation	This pressure is associated with sediment mobilisation as well as the deposition of organic matter. The spatial and temporal persistence of any change will depend on factors such as the gear type and intensity of the activity, levels of natural disturbance, temperature and the sediment type/composition, resulting in many changes being																	Yes

Pressure	Potential Impact	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	Appropriate assessment necessary? [16]
	relatively short lived and localised (Centre for Environment, 2011; ABPmer, 2008; O'Neill *et al.,* 2008; Dale *et al.,* 2011). Resuspension of organic rich sediments in the wake of towed gears can result in localised removal of oxygen in the water column or more anoxic conditions in the remaining substrate (Centre for Environment, 2011; Dale *et al.,* 2011; O'Neill *et al.,* 2008; Sewell *et al.,* 2007; Sewell and Hiscock, 2005; Kaiser *et al.,* 2002; Gubbay and Knapman, 1999; English Nature, 1992; Riemann and Hoffmann, 1991). Further, organic matter at the surface may be buried within anaerobic subsurface layers or conversely anaerobic sediments may be exposed to aerobic conditions by such mixing (Pilskaln *et al.,* 1998). In fisheries where discards are spatially concentrated, particularly in areas of low current flow, discards may cause localized hypoxia or anoxia of the seabed (Gilman *et al.,* 2012: Dayton *et al.,* 1995).																	
Introduction of light	Pressure relates to vessels associated with this sub-activity e.g. operational and navigation lighting. Marine birds are frequently attracted to or become disorientated by artificial light sources, which can result in collision and therefore injury or death (Thompson, 2013; BirdLife International, 2012; Montevecchi, 2006; Ryan, 1991). Disturbance caused by light from vessels may also be of concern, particularly where significant levels of activity occur in close proximity to sensitive bird habitats including coastal inshore waters (Montevecchi, 2006; Hill, 1992). However there are also concerns about the potential wider impacts of light pollution in the aquatic, particularly coastal, environment on the behaviour, reproduction and survival of marine invertebrates, amphibians and fish (Depledge *et al.,* 2010).																	Yes
Introduction of microbial pathogens	Bivalve parasites such as *Marteilia refringens* and *Bonamia ostreae* can devastate populations of species such as *Ostrea edulis* with diseases																	Yes

Pressure	Potential Impact	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	Appropriate assessment necessary? [16]
	marteiliosis and bonamiosis. The methods of infection transmission are not well understood. Direct transmission can occur but it is likely that secondary, intermediary, agents (such as zooplankton) are also required. Environmental conditions also play a key role in determining disease prevalence (UK Government (GOV.UK), 2015; ICES, 2012). Therefore, shellfish fisheries occurring in areas of parasite prevalence have the potential of transmitting the disease to infection free areas, although the likelihood of this is probably quite low.																	
Introduction or spread of non-indigenous species	Aquatic organisms may be transferred to new locations as biofouling on vessels and gear and can be harmful and invasive in locations where they do not naturally occur (Tidbury *et al.,* 2014; Pearce *et al.,* 2012; Dafforn *et al.,* 2011; ICES (International Council for Exploration of the Sea), 2009; Ware, 2009). All craft have some biofouling, even if recently cleaned or anti-fouled (International Maritime Organisation (IMO), 2012; Davidson *et al.,* 2010). In addition, this pressure could result from intentional or accidental release of seed stock associated with shellfishery activities (OSPAR Commission, 2011).																	Yes
Litter	Marine litter is items made or used by people and deliberately discarded or unintentionally lost into the sea and on beaches. Despite international legislation such as Annex V of the International Convention for the Prevention of Pollution from Ships, 1973 (International Maritime Organisation, 1983 - 2005), maritime activity is still a major source of litter. Fishing is an important source of marine litter. For example, 14 % of the litter identified during the UK Beachwatch survey (2006) was fishing related (Lozano and Mouat, 2009), net loss in UK fisheries has been estimated at 36 km per year (Brown and Macfadyen, 2007) and surveys across 32 sites in European waters (continental shelves to canyons) found that derelict fishing gear was the second most abundant item																	Yes

Pressure	Potential Impact	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	Appropriate assessment necessary? [16]
	encountered (34 % of total) (Pham *et al.,* 2014). Various types of litter result from fishing in general including galley waste, fish boxes, floats/buoys, nets, ropes, lines, pots, weights and micro-plastic particles resulting from disintegration of plastic gear (Bowmer and Kershaw, 2010; Lozano and Mouat, 2009). Impacts of such litter include entanglement of marine wildlife including mammals and birds, ingestion and ghost fishing (Wildfowl and Wetlands Trust (WWT) Consulting, 2012; Defra and UK MMAS, 2010; Lozano and Mouat, 2009; Brown and Macfadyen, 2007; Matsuoka *et al.,* 2005; Derraik, 2002). Ghost gears can also damage benthic habitats (through abrasion, 'plucking' of organisms or meshes closing around them, and the translocation of seabed features) (Brown and Macfadyen, 2007). Alongside existing legislation, potential mitigation measures are discussed in various sources of literature (Lozano and Mouat, 2009; Brown and Macfadyen, 2007; Derraik, 2002).																	
Nutrient enrichment	This pressure may result from disturbance and resuspension of the sediment in the wake of towed gears (Dale *et al.,* 2011; Sewell *et al.,* 2007; Riemann and Hoffmann, 1991), which can trigger considerable productivity pulses due to the rate of release of dissolved and particulate nutrients and have consequences for biogeochemical cycling (Polet and Depestele, 2010; Allen and Clarke, 2007; Kaiser *et al.,* 2002; Pilskaln *et al.,* 1998). The spatial and temporal persistence of any change will depend on factors such as the gear type and intensity of the activity, levels of natural disturbance and primary production, and the type/composition of the substrate and biota (including abundance of filter feeders) (Dale *et al.,* 2011; Allen and Clarke, 2007; Lohrer and Wetz, 2003; Pilskaln *et al.,* 1998).																	Yes
Organic enrichment	This pressure is associated with sediment mobilisation as well as the deposition of organic																	Yes

Pressure	Potential Impact	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	Appropriate assessment necessary? [16]
	matter. The spatial and temporal persistence of any change will depend on factors such as the gear type and intensity of the activity, levels of natural disturbance, temperature and the sediment type/composition, resulting in many changes being relatively short lived and localised (Centre for Environment, 2011; Dale *et al.,* 2011; ABPmer, 2008; O'Neill *et al.,* 2008). For fishing, the pressure may result from disturbance of the sediment in the wake of towed gears and resuspension of organic rich sediments (Centre for Environment, 2011; Dale *et al.,* 2011; O'Neill *et al.,* 2008; Sewell *et al.,* 2007; Sewell and Hiscock, 2005; Gubbay and Knapman, 1999; English Nature, 1992; Riemann and Hoffmann, 1991). Further, organic matter at the surface may be buried within anaerobic subsurface layers (Pilskaln *et al.,* 1998). In fisheries where discards are spatially concentrated, particularly in areas of low current flow, discards may result in localised increases in organic matter and potentially hypoxia or anoxia of the seabed (Gilman *et al.,* 2012; Dayton *et al.,* 1995).																	
Physical change (to another seabed type)	Mobile fishing gear is one of the best known sources of anthropogenic degradation of seabed habitat and associated benthic communities (see 'Abrasion' pressure). Whilst the physical damage caused by persistent interaction with bottom towed gear could result in loss of certain sensitive habitats such as seagrass, the change is unlikely to be permanent if the activity were to cease, although recovery rates may be slow in some cases. Therefore there may be few examples of where the association between the activity and this particular pressure is actually realised, but it should be taken into consideration (Kaiser *et al.,* 2002; Kaiser *et al.,* 2001).																	Yes
Physical change (to another	Mobile fishing gear is one of the best known sources of anthropogenic degradation of seabed habitat and associated benthic communities (see 'Abrasion' pressure). Whilst the physical damage caused by																	Yes

Pressure	Potential Impact	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	**Appropriate assessment necessary?** [16]
sediment type)	persistent interaction with bottom towed gear could result in loss of certain sensitive habitats such as seagrass, the change is unlikely to be permanent if the activity were to cease, although recovery rates may be slow in some cases. Therefore there may be few examples of where the association between the activity and this particular pressure is actually realised, but it should be taken into consideration (Kaiser *et al.,* 2002; Kaiser *et al.,* 2001).																	

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Table 14: Potential pressures for hand working fishing activities (Aggregated fish method: Shore-based activities) for the features of the Fal and Helford SAC (Key: S = Sensitive, NS = Not Sensitive, IE = Insufficient Evidence, NA = Not Assessed, greyed out = Not Relevant)

Pressures/Features	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	Screening justification	Risk profile
Abrasion/disturbance of the substrate on the surface of the seabed	S	S	S	NS					S	S	S				S	NA	IN	Medium to High
Habitat structure changes - removal of substratum (extraction)	S	S	S	S					S	S	S				S	NA	IN	Medium to High
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	S	S	S	NS					S	S	S				S	NA	IN	Medium to High
Removal of non-target species	S	S	S						S	S	S				S	NA	IN	Medium to High
Removal of target species	S	S	S						S		S					NA	IN	Medium to High
Visual disturbance			NS								NS						OUT	Medium to High
Collision ABOVE water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)																NA	OUT	Low
Deoxygenation	S	NS	S	NS					NS	NS	S				NS	NA	IN	Low
Hydrocarbon & PAH contamination	NA	NA	NA	NA					NA	NA	NA				NA	NA	OUT	Low
Introduction of light	IE	NS	S						S	S	S					NA	IN	Low
Introduction or spread of invasive non-indigenous species (INIS)	S	S	S	IE					S	S	S				S		IN	Low
Litter	NA	NA	NA	NA					NA	NA	NA				S	NA	IN	Low
Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)	NA	NA	NA	NA					NA	NA	NA				NA	NA	OUT	Low
Transition elements & organo-metal (e.g. TBT) contamination	NA	NA	NA	NA					NA	NA	NA				NA	NA	OUT	Low
Underwater noise changes											IE						OUT	Low

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The associated impacts of the potential pressures are identified as shown in Table 15 (Natural England, 2022);

Table 15: Summary of pressures that are capable of affecting the protected features of the SAC (Aggregated fish method: Shore-based activities)

Pressure	**Potential Impact**	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	**Appropriate assessment necessary?** [17]
Abrasion/ disturbance of the substrate on the surface of the seabed	Pressure would be exerted on intertidal habitats through harvesting of target species by hand or with apparatus such as rakes and forks. Further, abrasion is associated with the movement of people ('trampling') or indeed any vehicles used for access or participation in the fishing activity, and can result in damage to infauna and epifauna as well as sensitive habitats such as seagrass (Sheehan *et al*., 2010; Rossi *et al*., 2007; Alexandre *et al*., 2005; Cabaco *et al*., 2005; Sewell and Hiscock, 2005; Eckrich and Holmquist, 2000; Gubbay and Knapman, 1999; Eno *et al*., 1997; Brosnan and Crumrine, 1994).																	Yes
Habitat structure changes - removal of substratum (extraction)	Activities such as bait digging could cause this pressure through the displacement/removal of intertidal substrate (Fowler, 1999). However, the magnitude of the pressure will depend on the nature, scale, intensity and duration of the activity.																	Yes
Penetration and/or disturbance of the substratum below the surface of the seabed,	Pressure would be exerted on intertidal habitats through harvesting of target species by hand or with apparatus such as rakes and forks. Further, abrasion is associated with the movement of people ('trampling') or indeed any vehicles used for access or participation in the fishing activity, and can result in damage to infauna and epifauna as well as sensitive habitats such as seagrass (Sheehan *et al*., 2010; Rossi *et al*., 2007; Alexandre *et al*., 2005; Cabaco *et*																	Yes

[17] The pressure-feature interactions were included for assessment in Stage 2 if:
the feature is exposed to the pressure, or is likely to be in the future; and
the pressure is capable of affecting (other than insignificantly) the feature; or
it is not possible to determine whether the pressure is capable of affecting (other than insignificantly) the feature.

Pressure	Potential Impact	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	**Appropriate assessment necessary?** [17]
including abrasion	*al*., 2005; Sewell and Hiscock, 2005; Eckrich and Holmquist, 2000; Gubbay and Knapman, 1999; Eno *et al*., 1997; Brosnan and Crumrine, 1994).																	
Removal of non-target species	Bycatch (i.e. discarded catch) is associated with almost all fishing activities and is related to factors such as the gear type and its design (i.e. its selectivity), the targeted species and effort. There are significant concerns over the impacts of discards on marine ecosystems, including changes in population abundance and demographics of affected species and altered species assemblages and food web structures (Kaiser *et al*., 2001; Alverson *et al*., 1994). However, discards also provide important food resources for some scavenging species, including seabirds (Heath *et al*., 2014; Jennings and Kaiser, 1998). Similarly to their use at sea, nets and pots deployed from the shore, along with other shore-based activities such as angling, shellfish collection by hand (e.g. undersize target species damaged or exposed to predation, desiccation or freezing) and even bait digging can result in bycatch of fish, invertebrates and birds (Donaldson *et al*., 2010; Sewell and Hiscock, 2005; Cullen and McCarthy, 2002; Fowler, 1999; Gubbay and Knapman, 1999; Eno *et al*., 1997).																	Yes
Removal of target species	Shore-based fishing activities include bait collection, shellfish collection by hand, rod and line angling and the use of pots and nets from the shore. These activities target a range of crustacean, fish and bivalve species. Targeted species may themselves be of conservation importance, or may form part of the biotope or the wider community composition associated with designated features/sub-features (Joint Nature Conservation Council (JNCC) and Natural England (NE), 2011; Sewell and Hiscock, 2005; Gubbay and Knapman, 1999).																	Yes

Pressure	Potential Impact	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	**Appropriate assessment necessary?** [17]
Deoxygenation	Intensive bait digging can result in exposure of anoxic sediment layers (Howell, 1985), leading to reduced oxygen availability in surface sediments. High numbers of structures associated with activities such as crab tiling may change patterns of water movement over intertidal habitats and hence changes in sediment characteristics, such as a shallower oxygenated zone (Fowler, 1999). The spatial and temporal persistence of any change will depend on factors such as the intensity of the activity and levels of natural disturbance.																	Yes
Introduction of light	Pressure relates to vessels and potentially gear associated with this sub-activity e.g. operational and navigation lighting. Marine birds are frequently attracted to or become disorientated by artificial light sources, which can result in collision and therefore injury or death (Thompson., 2013; BirdLife International, 2012; Montevecchi, 2006; Ryan, 1991). Disturbance caused by light from vessels may also be of concern, particularly where significant levels of activity occur in close proximity to sensitive bird habitats including coastal inshore waters (Montevecchi, 2006; Hill, 1992). However there are also concerns about the potential wider impacts of light pollution in the aquatic, particularly coastal, environment on the behaviour, reproduction and survival of marine invertebrates, amphibians and fish (Depledge *et al*., 2010).																	Yes
Introduction or spread of invasive non-indigenous species (INIS)	Aquatic organisms may be transferred to new locations as biofouling on vessels and gear and can be harmful and invasive in locations where they do not naturally occur (Ware, 2009; ICES, 2009; Dafforn *et al*., 2011; Tidbury *et al*., 2014; Pearce, *et al*., 2012). All craft have some biofouling, even if recently cleaned or anti-fouled (IMO, 2012; Davidson *et al*., 2010).																	Yes

Pressure	Potential Impact	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Intertidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Subtidal coarse sediment	Intertidal seagrass beds	Subtidal seagrass beds	Intertidal rock	Infralittoral rock	Circalittoral rock	Maerl beds	Atlantic salt meadows	Shore dock	**Appropriate assessment necessary?** [17]
Litter	Marine litter is items made or used by people and deliberately discarded or unintentionally lost into the sea and on beaches. Despite international legislation such as Annex V of the International Convention for the Prevention of Pollution from Ships, 1973 (International Maritime Organisation, 1983 - 2005), maritime activity is still a major source of litter. Fishing is an important source of marine litter. For example, 14 % of the litter identified during the UK Beachwatch survey (2006) was fishing related (Lozano and Mouat, 2009), net loss in UK fisheries has been estimated at 36 km per year (Brown and Macfadyen, 2007) and surveys across 32 sites in European waters (continental shelves to canyons) found that derelict fishing gear was the second most abundant item encountered (34 % of total) (Pham *et al*., 2014). Various types of litter result from fishing in general including galley waste, fish boxes, floats/buoys, nets, ropes, lines, pots, weights and micro-plastic particles resulting from disintegration of plastic gear (Bowmer and Kershaw, 2010; Lozano and Mouat, 2009). Impacts of such litter include entanglement of marine wildlife including mammals and birds, ingestion and ghost fishing (Wildfowl and Wetlands Trust (WWT) Consulting, 2012; Defra and UK MMAS, 2010; Lozano and Mouat, 2009; Brown and Macfadyen, 2007; Matsuoka *et al*., 2005; Derraik, 2002). Ghost gears can also damage benthic habitats (through abrasion, 'plucking' of organisms or meshes closing around them, and the translocation of seabed features) (Brown and Macfadyen, 2007). Alongside existing legislation, potential mitigation measures are discussed in various sources of literature (Lozano and Mouat, 2009; Brown and Macfadyen, 2007; Derraik, 2002).																	Yes

		Activity	Feature
4.	Is the potential scale or magnitude of any effect likely to be significant alone and require appropriate assessment?[18][19]	**Yes:** Dredges (towed): oysters	Intertidal mixed sediments Intertidal mud Intertidal sand and muddy sand Intertidal coarse sediment Subtidal mixed sediments Subtidal mud Subtidal sand Subtidal coarse sediment Intertidal seagrass beds Subtidal seagrass beds Intertidal rock Infralittoral rock Circalittoral rock Maerl beds Atlantic salt meadows
		Yes: Intertidal activities: hand working	Intertidal mixed sediments Intertidal mud Intertidal sand and muddy sand Intertidal coarse sediment Intertidal seagrass beds Subtidal seagrass beds Intertidal rock Atlantic salt meadows

For each activity assessed in Stage 1 (LSE), there were two possible outcomes for each identified pressure-feature interaction:

The pressure-feature interactions were not included for assessment in Stage 2 (Appropriate Assessment) if:

the feature is not exposed to the pressure, and is not likely to be in the future; or

the pressures are not capable of affecting (other than insignificantly) the protected features of the SAC.

The pressure-feature interactions were included for assessment in Stage 2 if:

the feature is exposed to the pressure, or is likely to be in the future; and

the pressure is capable of affecting (other than insignificantly) the feature; or

it is not possible to determine whether the pressure is capable of affecting (other than insignificantly) the feature.

[18] Yes or uncertain: completion of AA required (Section 9). If no: LSE required only.

[19] Activity levels explained in Section 6 and Annex 3.

9. Appropriate Assessment

If a Test of Likely Significant Effect (Section 8) identified the potential for a significant effect on the site features/ sub-features it is followed by an Appropriate Assessment to assess if the potential significant effect is likely to have an adverse effect on the integrity of the site.

9.1 Potential risks to features

The potential pressures, ecological impacts, level of exposure and mitigation measures are summarised in Table 16.

Table 16: Summary of impacts

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
Estuaries; Intertidal coarse sediment, Intertidal mixed sediments, Intertidal mud, Intertidal sand and muddy sand Subtidal mixed sediments, Subtidal mud **Large shallow inlets and bays (LSIB);** Intertidal coarse sediment, Intertidal sand and muddy sand Subtidal mixed sediments,	**Distribution: presence and spatial distribution of biological communities**	**Maintain** the presence and spatial distribution of [Mudflats and sandflats] communities **Restore** the presence and spatial distribution of [Estuary/ LSIB/ Subtidal sandbank] communities **Maintain** the presence and spatial distribution of [intertidal coarse sediment/ intertidal mixed sediment/ intertidal mud/ intertidal sand and muddy sand] communities	Operation: FISHING Activity **DREDGES** **Abrasion/ disturbance of the substrate on the surface of the seabed** **Changes in suspended solids (water clarity)** **Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** **Smothering and siltation**	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** The Fal Fishery falls within part of the SAC, the Fishery limits can be seen in Figure 1 (Section 6.3.2). Sail boats mainly operate in areas A and B (Figure 3) and work the longest tow lines possible given the wind conditions whilst towing dredge gear. Haul /tow boats are small punts and operate in the River section (Area C). The dredge is towed as the fishermen winches, by hand, back to an anchor deployed a short distance away. The dredge contents from the 2022 CIFCA Fal oyster survey gives an indication of substrate type within the fishery (Annex Figure C). The Fishery area within Carrick Roads is predominantly sublittoral mixed sediments (A5.4) (Magic, 2020). The Upper Carrick Roads is characterised by mixed muddy sand and shell sediments with the exception being	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** Under requirements of the Habitats Directive Natural England conduct on-going condition monitoring on the features/sub-features of the SAC, reporting to European Commission every six years. Natural England's condition monitoring provides evidence for the condition of the site features within the SAC. Monitoring of effort via monthly catch statistics is in place.	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
Subtidal mud, Subtidal sand **Mudflats and sandflats not covered by seawater at low tide** Intertidal coarse sediment, Intertidal mixed sediments, Intertidal mud, Intertidal sand and muddy sand **Sandbanks which are slightly covered by sea water all the time;** Subtidal coarse sediment, Subtidal mixed sediment, Subtidal sand	**Extent and distribution**	**Maintain** the presence and spatial distribution of [subtidal coarse sediment/ subtidal sand/ subtidal mud] communities **Restore** the presence and spatial distribution of [subtidal mixed sediment] communities **Maintain** the total extent and spatial distribution of the [Estuary/ LSIB/ Mudflats and sandflats/ Subtidal sandbank] to ensure no loss of integrity, whilst allowing for natural change and succession **Maintain** the total extent and spatial distribution of [intertidal coarse sediment/ intertidal mixed sediment/ intertidal mud/ intertidal sand and muddy sand].	**rate changes (Light)** **Physical change (to another sediment type)**	the deep central channel which is composed predominantly of subtidal mud. Additional patches of subtidal mud extend into the lower Carrick Roads (Howson *et al.,* 2004; Allen and Proctor, 2003). Soft estuarine muds are present in the upper reaches of the Fal and its constituent tributaries (Allen and Proctor, 2003; Moore *et al.,* 1999). In the estuaries it is typically the *'Aphelochaeta marioni* and *Tubificoides* spp in variable salinity infralittoral mud' communities which dominate the sublittoral mud. Further into the Carrick Roads, *Melinna palmata* with *Magelona* spp. and *Thyasira* spp. in infralittoral sandy mud' (A5.334) is present (Allen and Proctor, 2003). The dredges used in the Fishery are lightweight as they are hand hauled. It states in the Regulations that a person must not use a dredge for taking shellfish which incorporates any teeth, tines or other digging projections, exceeds a weight of 20kg or exceeds an overall width of 1.20m. These measures ensure that the physical disturbance of the fishery is minimal. A person must not dredge for, fish for or take oysters in the fishery area unless licensed to do so by the Authority (Cornwall IFCA). The fishery is restricted to sail or hand-powered vessels which limits the impact on the habitats Dredging is restricted to certain times of year; the fishery may only be dredged from 1st October to 31st March in any year. Dredging on lays can occur outside of this, although there is an exclusion period between for native oysters	A value of 42 licence holders was set as a trigger. This number was calculated by using the highest number of licence holders over 2014-15 to 2016-17 fishery seasons plus 20% (35 licence holders in 2016-17). In 2021-22 fishery season, there were 28 licence holders. A total of 71 dredge licences was set as a revised trigger for operational dredges as an indicator of effort. This number was calculated by using the highest number of dredge licences issued over 2014-15 to 2016-17 fishery seasons plus 20% (59 dredge licences in 2016-17). In 2021-22 fishery season, there were 42 dredge licences. With the analysis of the licence holders returns data from the fishery an additional effort trigger was set for 17,500 dredge hours. This number was selected from using the highest landings (oysters and queen scallops combined) from previous	

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
		Maintain the total extent and spatial distribution of [subtidal coarse sediment/ subtidal sand/ subtidal mud/ subtidal mixed sediment].		from 14th of May to 4th of August and requires consent from the Authority. The fishery is restricted to certain times of day within the open period; between the hours of 09:00 and 15:00 Monday to Friday and between the hours of 09:00 and 13:00 on a Saturday. No fishing is permitted on Sundays. LOW EXPOSURE	fishery seasons 2014-15 to 2017-18 (113,825 kg and 17,249 dredge hours in 2017-18) and rounded up to allow some flexibility for the next fishery season. In 2021-22, approximately 9,619 dredge hours were reported. This is a slight under representation of the actual value due to missing attribute data. This is from where number of licences or hours fished were not advised on the returns forms for 78 kg of native oysters and 1,420 kg queen scallops dredged. An estimated LPUE of queen scallops at 6.57 kg/ dredge hour would only equal an additional 216 dredge hours missing from the total reported. Additionally, 14% of returns for October to March are currently missing from licence holders. Missing returns from licence holders will be submitted by the end of the season (September 2022). Progress still needs to be made on missing gear type, number of licences or	
	Structure and function: presence and abundance of key structural and influential species **Structure: species composition of component communities**	[**Maintain** OR **Recover** OR **Restore**] the abundance of listed typical species, to enable each of them to be a viable component of the habitat. **Maintain** [LSIB] the species composition of component communities **Restore** [Estuary/ Mudflats and sandflats/ Subtidal sandbank] the species composition of				

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
		component communities **Maintain** [intertidal mud] the species composition of component communities. **Restore** [intertidal coarse sediment/ intertidal mixed sediment/ intertidal sand and muddy sand] the species composition of component communities. **Maintain** [subtidal sand/ subtidal mixed sediments/ subtidal coarse sediment] the species composition of component communities. **Restore** [subtidal mud] the species composition of component communities.			hours fished on returns forms. Cornwall IFCA officers monitor the fishery through boarding's of vessels at sea, inspections of harvesting and lay areas and quayside inspections of landings. Should dredge licence numbers exceed 71, dredge hours exceed 17,500, or an adverse effect or a risk of adverse effect on the features/sub-features arise, re-assessment and mitigation measures will be implemented if necessary (See Section 17/ Annex 4). This assessment is also subject to annual review. NO ADDITIONAL MITIGATION MEASURES ARE NECESSARY	
				Changes in suspended solids (water clarity) The dredges used in the Fishery are lightweight as they are hand hauled. It states in the Regulations that a person must not use a dredge for taking shellfish which incorporates any teeth, tines or other digging projections, exceeds a weight of 20kg or exceeds an overall width of 1.20m. These measures	**Changes in suspended solids (water clarity)** See above 'Abrasion/ disturbance of the substrate on the surface of the seabed' mitigation measures (Page 45).	**Changes in suspended solids (water clarity)** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
				ensure that the physical disturbance of the fishery is minimal. The fishery is restricted to sail or hand-powered vessels which limits the impact on the habitats LOW EXPOSURE		
				Smothering and siltation rate changes (Light) The dredges used in the Fishery are lightweight as they are hand hauled. It states in the Regulations that a person must not use a dredge for taking shellfish which incorporates any teeth, tines or other digging projections, exceeds a weight of 20kg or exceeds an overall width of 1.20m. These measures ensure that the physical disturbance of the fishery is minimal. The fishery is restricted to sail or hand-powered vessels which limits the impact on the habitats LOW EXPOSURE	**Smothering and siltation rate changes (Light)** See above 'Abrasion/ disturbance of the substrate on the surface of the seabed' mitigation measures (Page 45).	**Smothering and siltation rate changes (Light)** **NO**
				Physical change (to another sediment type) The fishery has an exclusion zone which ensures sensitive habitats (including seagrass beds and maerl beds) are avoided. Cultch is a natural material, mainly comprised of dead shell, which is scattered on the seabed to provide a rough surface to which the oyster spat can easily attach. Small amounts of cultch (less than 1 tonne) have been laid within the fishery and periodically, approximately every two to three years although it is not thought that large quantities of cultch have been laid	**Physical change (to another sediment type)** N/A	**Physical change (to another sediment type)** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
				for 30 years. Some dead slipper limpet shells were laid on Maggoty Bank over the last ten years and some oyster shell from the Falmouth Oyster Festival was re-laid in positions to the East of Carrick Carly's Rocks and on Parsons Bank. Permission was sought from the Falmouth and Truro Port Health Authority for this. This activity would now require a marine licence from the Marine Management Organisation. This activity is not known to have occurred in recent memory and is not likely to occur due to the risk of the introduction of pests (P Ferris 2017, pers. comm). The deposit of cultch has not occurred in recent years and would now require a marine license to be permitted. No potential for a physical change to be caused due to oyster dredging within the SAC. NO EXPOSURE		
Estuaries; Subtidal seagrass beds **Large shallow inlet and bays;** Subtidal seagrass beds **Mudflats and sandflats not covered by seawater at low tide**	**Distribution: presence and spatial distribution of biological communities**	**Maintain** the presence and spatial distribution of [Mudflats and sandflats] communities **Restore** the presence and spatial distribution of [Estuary/ LSIB/ Subtidal sandbanks] communities	Operation: FISHING Activity **DREDGES** **Abrasion/ disturbance of the substrate on the surface of the seabed** **Changes in suspended solids (water clarity)**	**Abrasion/ disturbance of the substrate on the surface of the seabed** Resistance: Low Resilience: Medium Sensitivity: Medium (d'Avack, *et al*., 2019). **AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** Resistance: None Resilience: Low Sensitivity: High (d'Avack, *et al*., 2019). A small bed of subtidal seagrass lies south of Penarrow Point which is included in the	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** Under requirements of the Habitats Directive Natural England conduct on-going condition monitoring on the features/sub-features of the SAC, reporting to European	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed,**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
Intertidal seagrass beds **Sandbanks which are slightly covered by sea water all the time;** Subtidal seagrass beds	**Extent and distribution**	**Maintain** the presence and spatial distribution of intertidal seagrass bed communities **Restore** the presence and spatial distribution of subtidal seagrass bed communities **Maintain** the total extent and spatial distribution of [Estuary/ LSIB/ Mudflats and sandflats/ Subtidal sandbanks] to ensure no loss of integrity, whilst allowing for natural change and succession **Maintain** the total extent and spatial distribution of [intertidal] seagrass beds. **Restore** the total extent and spatial distribution of	**Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** **Smothering and siltation rate changes (Light)** **Physical change (to another sediment type)**	boundary of the Fal Fishery Order 2016 (Annex Figure D). An exclusion zone was introduced through the 2017 Regulations under the Fal Fishery Order 2016 which prevents dredging from occurring in most of the habitat. A small section close inshore at Penarrow Point remains within the fishery (Annex Figure D). Appropriate signage in the form of a yellow buoy clearly delineates the northern and eastern boundaries of the Exclusion Zone. '*Zostera marina* beds on lower shore or infralittoral clean or muddy sand' (A5.5331) is the biotope for the subtidal feature within the site (Natural England, 2022). The seagrass bed was surveyed in 2015 by Ecospan as part of the feature condition assessment (Curtis, 2015). The total area of seagrass which qualified as a bed at Penarrow Point was 7.48 ha. The mean percentage of seagrass cover within that extent was just 34%. The seagrass at Penarrow Point was extremely fragmented, 31% and 64% of the total area of bed was considered to be 'sparse' or 'very sparse' respectively (Curtis, 2015). A small seagrass bed, near Carclase Point, is within the boundary of the Fal Fishery Order 2016 (Annex Figure D). This bed is at the northern end of the larger St Mawes Bank seagrass bed (Curtis, 2015). The total area of seagrass ≥5% cover at St Mawes Bank was 8.14 ha, the mean percentage cover within that total area was 63%. The seagrass rarely extended beyond 60 m from the shore, and at the outer periphery of the bed percentage cover values of 90% were frequently recorded	Commission every six years. Natural England's condition monitoring provides evidence for the condition of the site features within the SAC. Cornwall IFCA will continue to monitor the seagrass beds within the Fal Fishery area as part of routine monitoring. Under Regulation 9 of the Fal Fishery Order 2016 dredging is prohibited in Exclusion Zone 1 to ensure compliance with the Conservation of Habitats and Species Regulations 2010 for seagrass bed communities (see Figure 2). Cornwall IFCA enforcement officers will continue to patrol the fishery and ensure that the exclusion zone is adhered to. Despite the lack of change to the extent since 2015, the areas of seagrass recorded outside of the exclusion zone will be included in a Code of Conduct to highlight the areas of seagrass within the fishery which will	**including abrasion** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
	Extent of supporting habitat **Structure and function: presence and abundance of key structural and influential species** **Structure: biomass**	[subtidal] seagrass beds. **Maintain** the area of habitat which is likely to support the subfeature. [**Maintain** OR **Recover** OR **Restore**] the abundance of listed typical species, to enable each of them to be a viable component of the habitat **Maintain** the [intertidal seagrass] leaf / shoot density, length, percentage cover, and rhizome mat across the feature at natural levels (as far as possible), to		which quickly dissipated to 0% within the space of 20 m (Curtis, 2015). The area near Penarrow was surveyed in July 2017 when 14 drop down video tows were carried out in and near the exclusion zone (Davies *et al.,* 2018). The majority of the habitat recorded consisted of mixed sediment, including maerl, and seagrass was found to be patchy when recorded. Seagrass was not recorded outside of the exclusion zone. In 2021 Cornwall IFCA surveyed the seagrass beds within the Fal and Helford SAC using an MX Aquatic Habitat Echosounder and recorded the extent and height of the seagrass including the beds near Penarrow and St Mawes Bank (Jenkin *et al.,* 2021). The seagrass beds at Penarrow and St Mawes Bank followed the extent found by Curtis (2015). The area (ha) of plant coverage >=5% to 100% for the seagrass bed at Penarrow Point was 9.38 ha and St.Mawes Bank was 3.77 ha. The results can be seen in Annex Figure E and Annex Figure F. The two areas of seagrass within the fishery are situated close inshore fringed by rock, extending up to 40 m into the channel. Due to the positioning and depth of the beds it is not reachable by the sail boats and extremely unlikely that the area would be fished by oyster punts. The recent Fal and Helford SAC Condition Assessment (Natural England, 2020) has identified the subtidal seagrass beds as unfavourable due to anchoring and mooring.	continue to be avoided by dredging. If an adverse effect or a risk of adverse effect on the features/sub-features arise, re-assessment and mitigation measures will be implemented if necessary (See Section 17/ Annex 4). This assessment is also subject to annual review. NO ADDITIONAL MITIGATION MEASURES ARE NECESSARY	

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
		ensure a healthy, resilient habitat. **Restore** the [subtidal seagrass] leaf / shoot density, length, percentage cover, and rhizome mat across the feature at natural levels (as far as possible), to ensure a healthy, resilient habitat.		Seagrass beds (*Zostera marina*) are assessed as being moderately sensitive but also has moderate recoverability to abrasion and physical disturbance (Tyler-Walters, 2008). MEDIUM EXPOSURE		
	Structure: rhizome structure and reproduction	**Maintain** the [intertidal seagrass] extent and structure of the rhizome mats across the site, and conditions to allow for regeneration of seagrass beds. **Restore** the [subtidal seagrass] extent and structure of the rhizome mats across the site, and conditions to allow for		**Changes in suspended solids (water clarity)** Resistance: Low Resilience: Low Sensitivity: High (d'Avack, *et al*., 2019). A small bed of subtidal seagrass lies south of Penarrow Point which is included in the boundary of the Fal Fishery Order 2016 (Annex Figure D). An exclusion zone was introduced through the 2017 Regulations under the Fal Fishery Order 2016 which prevents dredging from occurring in most of the habitat. A small section close inshore at Penarrow Point remains within the fishery (Annex Figure D). Appropriate signage in the form of a yellow buoy clearly delineates the northern and eastern boundaries of the Exclusion Zone. A small seagrass bed, near Carclase Point, is within the boundary of the Fal Fishery Order 2016 (Annex Figure D). This bed is at the northern end of the larger St Mawes Bank seagrass bed (Curtis, 2015). In 2021 Cornwall IFCA surveyed the seagrass beds within the Fal and Helford SAC using an MX Aquatic Habitat Echosounder and recorded the extent and height of the seagrass including the beds near Penarrow and St Mawes Bank (Jenkin *et al.,* 2021). The seagrass beds at Penarrow and St Mawes Bank followed the	**Changes in suspended solids (water clarity)** See above 'Abrasion/ disturbance of the substrate on the surface of the seabed' mitigation measures (Page 50).	**Changes in suspended solids (water clarity)** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
	Structure: species composition of component communities	regeneration of seagrass beds. **Maintain** [LSIB] the species composition of component communities **Restore** [Estuary/ Mudflats and Sandflats/ Subtidal sandbanks] the species composition of component communities **Maintain** [intertidal and subtidal seagrass beds] the species composition of component communities		extent found by Curtis (2015). The area (ha) of plant coverage >=5% to 100% for the seagrass bed at Penarrow Point was 9.38 ha and St.Mawes Bank was 3.77 ha. The results can be seen in Annex Figure E and Annex Figure F. The two areas of seagrass within the fishery are situated close inshore fringed by rock, extending up to 40 m into the channel. Due to the positioning and depth of the beds it is not reachable by the sail boats and extremely unlikely that the area would be fished by oyster punts. The recent Fal and Helford SAC Condition Assessment (Natural England, 2020) has identified the subtidal seagrass beds as unfavourable due to anchoring and mooring. LOW EXPOSURE		
				Smothering and siltation rate changes (Light) Resistance: Low Resilience: Medium Sensitivity: Medium (d'Avack, *et al*., 2019). A small bed of subtidal seagrass lies south of Penarrow Point which is included in the boundary of the Fal Fishery Order 2016 (Annex Figure D). An exclusion zone was introduced through the 2017 Regulations under the Fal Fishery Order 2016 which prevents dredging from occurring in most of the habitat. A small section close inshore at Penarrow Point remains within the fishery (Annex Figure D).	**Smothering and siltation rate changes (Light)** See above 'Abrasion/ disturbance of the substrate on the surface of the seabed' mitigation measures (Page 50).	**Smothering and siltation rate changes (Light)** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
				Appropriate signage in the form of a yellow buoy clearly delineates the northern and eastern boundaries of the Exclusion Zone. A small seagrass bed, near Carclase Point, is within the boundary of the Fal Fishery Order 2016 (Annex Figure D). This bed is at the northern end of the larger St Mawes Bank seagrass bed (Curtis, 2015). In 2021 Cornwall IFCA surveyed the seagrass beds within the Fal and Helford SAC using an MX Aquatic Habitat Echosounder and recorded the extent and height of the seagrass including the beds near Penarrow and St Mawes Bank (Jenkin *et al.,* 2021). The seagrass beds at Penarrow and St Mawes Bank followed the extent found by Curtis (2015). The area (ha) of plant coverage >=5% to 100% for the seagrass bed at Penarrow Point was 9.38 ha and St.Mawes Bank was 3.77 ha. The results can be seen in Annex Figure E and Annex Figure F. The two areas of seagrass within the fishery are situated close inshore fringed by rock, extending up to 40 m into the channel. Due to the positioning and depth of the beds it is not reachable by the sail boats and extremely unlikely that the area would be fished by oyster punts. The recent Fal and Helford SAC Condition Assessment (Natural England, 2020) has identified the subtidal seagrass beds as unfavourable due to anchoring and mooring. LOW EXPOSURE		

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
				Physical change (to another sediment type) Resistance: Low Resilience: Very low Sensitivity: High (d'Avack, *et al*., 2019). A small bed of subtidal seagrass lies south of Penarrow Point which is included in the boundary of the Fal Fishery Order 2016 (Annex Figure D). An exclusion zone was introduced through the 2017 Regulations under the Fal Fishery Order 2016 which prevents dredging from occurring in most of the habitat. A small section close inshore at Penarrow Point remains within the fishery (Annex Figure D). Appropriate signage in the form of a yellow buoy clearly delineates the northern and eastern boundaries of the Exclusion Zone. '*Zostera marina* beds on lower shore or infralittoral clean or muddy sand' (A5.5331) is the biotope for the subtidal feature within the site (Natural England, 2022). The seagrass bed was surveyed in 2015 by Ecospan as part of the feature condition assessment (Curtis, 2015). The total area of seagrass which qualified as a bed at Penarrow Point was 7.48 ha. The mean percentage of seagrass cover within that extent was just 34%. The seagrass at Penarrow Point was extremely fragmented, 31% and 64% of the total area of bed was considered to be 'sparse' or 'very sparse' respectively (Curtis, 2015). A small seagrass bed, near Carclase Point, is within the boundary of the Fal Fishery Order 2016 (Annex Figure D). This bed is at the northern end of the larger St Mawes Bank	**Physical change (to another sediment type)** See above 'Abrasion/ disturbance of the substrate on the surface of the seabed' mitigation measures (Page 50).	**Physical change (to another sediment type)** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
				seagrass bed (Curtis, 2015). The total area of seagrass ≥5% cover at St Mawes Bank was 8.14 ha, the mean percentage cover within that total area was 63%. The seagrass rarely extended beyond 60 m from the shore, and at the outer periphery of the bed percentage cover values of 90% were frequently recorded which quickly dissipated to 0% within the space of 20 m (Curtis, 2015). The area near Penarrow was surveyed in July 2017 when 14 drop down video tows were carried out in and near the exclusion zone (Davies *et al.,* 2018). The majority of the habitat recorded consisted of mixed sediment, including maerl, and seagrass was found to be patchy when recorded. Seagrass was not recorded outside of the exclusion zone. In 2021 Cornwall IFCA surveyed the seagrass beds within the Fal and Helford SAC using an MX Aquatic Habitat Echosounder and recorded the extent and height of the seagrass including the beds near Penarrow and St Mawes Bank (Jenkin *et al.,* 2021). The seagrass beds at Penarrow and St Mawes Bank followed the extent found by Curtis (2015). The area (ha) of plant coverage >=5% to 100% for the seagrass bed at Penarrow Point was 9.38 ha and St.Mawes Bank was 3.77 ha. The results can be seen in Annex Figure E and Annex Figure F. The two areas of seagrass within the fishery are situated close inshore fringed by rock, extending up to 40 m into the channel. Due to the positioning and depth of the beds it is not reachable by the sail boats and extremely		

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
				unlikely that the area would be fished by oyster punts. The recent Fal and Helford SAC Condition Assessment (Natural England, 2020) has identified the subtidal seagrass beds as unfavourable due to anchoring and mooring. Seagrass beds (*Zostera marina*) are assessed as being moderately sensitive but also has moderate recoverability to abrasion and physical disturbance (Tyler-Walters, 2008). LOW EXPOSURE		
Estuaries; Infralittoral rock **Large shallow inlet and bays;** Intertidal rock, Infralittoral rock, Circalittoral rock **Reefs;** Intertidal rock, Infralittoral rock, Circalittoral rock	**Distribution: presence and spatial distribution of biological communities** **Extent and distribution**	**Restore** the presence and spatial distribution of [Estuary/ LSIB/ Reefs] communities **Maintain** the presence and spatial distribution of [intertidal rock/ infralittoral rock] communities **Restore** the presence and spatial distribution of [circalittoral rock] communities **Maintain** the total extent and spatial distribution of the [Estuary/ LSIB] to	Operation: FISHING Activity **DREDGES** **Abrasion/ disturbance of the substrate on the surface of the seabed** **Changes in suspended solids (water clarity)** **Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion**	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** Circalittoral rock is generally restricted to Falmouth Bay (Natural England, 2022). Infralittoral rock is present in estuarine areas with the main areas of estuarine bedrock and boulder found in the lower estuarine sections of the Fal River. The estuarine rock and boulder habitats support kelp communities (*Laminaria hyperborean, Laminaria ochroleuca* and *Saccorhiza polyschides*) as well as species of foliose red algae and filter-feeding sessile fauna (Natural England, 2022). The dredges used in the Fishery are lightweight as they are hand hauled. It states in the Regulations that a person must not use a dredge for taking shellfish which incorporates any teeth, tines or other digging projections, exceeds a weight of 20kg or exceeds an	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** Under requirements of the Habitats Directive Natural England conduct on-going condition monitoring on the features/sub-features of the SAC, reporting to European Commission every six years. Natural England's condition monitoring provides evidence for the condition of the site features within the SAC. Should an adverse effect or a risk of adverse effect on the features/sub-features	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
		ensure no loss of integrity, while allowing for natural change and succession **Maintain** the total extent, spatial distribution and types of [Reef] (and each of its sub-features), subject to natural variation in sediment veneer **Maintain** the total extent and spatial distribution of [intertidal rock/ infralittoral rock/ circalittoral rock], subject to natural variation in sediment veneer.	**Smothering and siltation rate changes (Light)** **Physical change (to another seabed type)**	overall width of 1.20m. These measures ensure that the physical disturbance of the fishery is minimal. The fishery is restricted to sail or hand-powered vessels which limits the impact on the habitats Sub-tidal reef communities are spatially separate from the areas in which oyster dredges are used. The oyster dredge is hand hauled lightweight gear, restricted to sail or hand-powered vessels, and not sufficiently robust to use on rough ground; therefore, fishers will actively avoid areas of potential reef/ rocky ground to prevent gear damage/ loss. LOW EXPOSURE	arise, re-assessment and mitigation measures will be implemented if necessary (See Section 17/ Annex 4). This assessment is also subject to annual review. NO ADDITIONAL MITIGATION MEASURES ARE NECESSARY	
	Structure and function: presence and abundance of key structural and	[**Maintain** OR **Recover** OR **Restore**] the abundance of listed typical species, to enable each of them to be a viable	**Changes in suspended solids (water clarity)** The dredges used in the Fishery are lightweight as they are hand hauled. It states in the Regulations that a person must not use a dredge for taking shellfish which incorporates any teeth, tines or other digging projections, exceeds a weight of 20kg or exceeds an overall width of 1.20m. These measures ensure that the physical disturbance of the fishery is minimal. The fishery is restricted to sail or hand-powered vessels which limits the impact on the habitats LOW EXPOSURE	**Changes in suspended solids (water clarity)** See above 'Abrasion/ disturbance of the substrate on the surface of the seabed' mitigation measures (Page 58).	**Changes in suspended solids (water clarity)** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
	influential species **Structure: species composition of component communities**	component of the habitat **Maintain** [LSIB/ Reefs] the species composition of component communities **Restore** [Estuary] the species composition of component communities **Maintain** [intertidal rock/ infralittoral rock/ circalittoral rock/] the species composition of component communities.		**Smothering and siltation rate changes (Light)** The dredges used in the Fishery are lightweight as they are hand hauled. It states in the Regulations that a person must not use a dredge for taking shellfish which incorporates any teeth, tines or other digging projections, exceeds a weight of 20 kg or exceeds an overall width of 1.20 m. These measures ensure that the physical disturbance of the fishery is minimal. The fishery is restricted to sail or hand-powered vessels which limits the impact on the habitats LOW EXPOSURE	**Smothering and siltation rate changes (Light)** See above 'Abrasion/ disturbance of the substrate on the surface of the seabed' mitigation measures (Page 58).	**Smothering and siltation rate changes (Light)** **NO**
				Physical change (to another seabed type) No potential for a physical change to be caused due to oyster dredging within the SAC. NO EXPOSURE	**Physical change (to another seabed type)** N/A	**Physical change (to another seabed type)** **NO**
Estuaries; Maerl beds **Large shallow inlet and bays;** Maerl beds **Sandbanks which are slightly covered by sea**	**Distribution: presence and spatial distribution of biological communities**	**Restore** the presence and spatial distribution of [Estuary/ LSIB/ Subtidal sandbanks] communities **Maintain** the presence and spatial distribution	Operation: FISHING Activity **DREDGES** **Abrasion/ disturbance of the substrate on the surface of the seabed**	**Abrasion/ disturbance of the substrate on the surface of the seabed** Resistance: None Resilience: Very low Sensitivity: High (Perry *et al*., 2018). **AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion**	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** Under requirements of the Habitats Directive Natural England conduct on-going	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
water all the time; Maerl beds	**Extent and distribution** **Extent of supporting habitat** **Structure and function: presence and abundance of key**	of maerl bed communities **Maintain** the total extent and spatial distribution of [Estuary/ LSIB/ Subtidal sandbanks] to ensure no loss of integrity, whilst allowing for natural change and succession **Maintain** the total extent and spatial distribution of maerl bed. **Maintain** the total extent and spatial distribution of maerl in sediment. Maintain the area of habitat which is likely to support the subfeature. [**Maintain** OR **Recover** OR **Restore**] the abundance of listed typical	**Changes in suspended solids (water clarity)** **Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** **Smothering and siltation rate changes (Light)**	Resistance: None Resilience: Very low Sensitivity: High (Perry *et al*., 2018). Maerl beds composed of either or both *Lithothamnion corallioides* and *Phymatolithon calcareum* species are present within the Carrick Roads, Falmouth Bay, and the Helford (Allen *et al.,* 2014; Howson *et al.,* 2004). *Phymatolithon calcareum* maerl beds in infralittoral clean gravel or coarse sand' (A5.511) can be found within the St. Mawes bed and typically located in the middle of the bed (Allen *et al.,* 2014). '*Lithothamnion corallioides* maerl beds on infralittoral muddy gravel' (A5.513) can be found at Castle Point, as well as being common to the north, south and edges of the live St. Mawes bank bed (Gall, 2014; Allen *et al.,* 2014). The largest live maerl beds in the site are the St. Mawes Bank and Castle Point bed in the Fal (Allen *et al.,* 2014). The two beds are separated by maerl gravels (Howson *et al.,* 2004). Dead maerl beds are also present within the site with varying volumes of live maerl present. In the lower Carrick Roads, dead maerl beds are present towards the entrance of Falmouth Harbour (Sheehan *et al.,* 2014). Live maerl beds are not within the fishery limit. The southern limit of the Fal Fishery was changed from the previous limit within the Truro Port Fishery (Variation) Order 1975 to exclude maerl bed communities from the boundary of the Fal Fishery Order 2016.	condition monitoring on the features/sub-features of the SAC, reporting to European Commission every six years. Natural England's condition monitoring provides evidence for the condition of the site features within the SAC. Cornwall IFCA enforcement officers will continue to patrol the fishery and ensure that the exclusion zone and southern boundary is adhered to. Should dredge licence numbers exceed 71, dredge hours exceed 17,500, or an adverse effect or a risk of adverse effect on the features/sub-features arise, re-assessment and mitigation measures will be implemented if necessary (See Section 17/ Annex 4). This assessment is also subject to annual review. NO ADDITIONAL MITIGATION MEASURES ARE NECESSARY	**below the surface of the seabed, including abrasion** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
	structural and influential species **Structure: age / size frequency** **Structure: biomass** **Structure: population abundance** **Structure: species composition of component communities**	species, to enable each of them to be a viable component of the habitat **Restore** the size structure and composition of maerl thalli across the site. **Restore** the biomass of maerl to natural levels within the site, to ensure a healthy, resilient habitat. **Restore** the abundance of maerl across the subfeature. **Maintain** [LSIB] the species composition of component communities **Restore** [Estuary/ Subtidal		Appropriate signage in the form of a yellow buoy clearly delineates the northern and eastern boundaries of the Exclusion Zone. However, fragments of live maerl were recorded in eight sites within the Fal Oyster Survey 2019. At seven of these sites there was one fragment of live maerl and one site which had five fragments (Jenkin *et al.,* 2019). Low amounts of dead maerl fragments were recorded at 11 sites during the survey. Most of the fragments were recorded in the southern part of the Fishery. During the Fal Oyster Survey 2020 live maerl (seven fragments) was recorded at one site and fragments of dead maerl were recorded at 10 sites (Jenkin *et al.,* 2020). This year (2022) live maerl (one fragment) was recorded at one site and fragments of dead maerl were recorded at six sites which can be seen in Annex Figure C (Jenkin *et al.,* 2022). The area in and around the exclusion zone was last surveyed in July 2017 when 14 tows were carried out (Davies *et al.,* 2018). The majority of the habitat recorded consisted of mixed sediment, including maerl, and seagrass was found to be patchy when recorded. Live maerl was recorded outside of the exclusion zone. The recent Fal and Helford SAC Condition Assessment (Natural England, 2020) has identified the maerl beds as unfavourable due historical extraction and dredging, and on-going anchoring of commercial vessels. MEDIUM EXPOSURE		

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
		sandbanks] the species composition of component communities **Restore** [maerl beds] the species composition of component communities		**Changes in suspended solids (water clarity)** Resistance: Medium Resilience: Very low Sensitivity: Medium (Perry *et al*., 2018). Maerl beds are not within the fishery limit. The southern limit of the Fal Fishery was changed from the previous limit within the Truro Port Fishery Regulating Order (1936 amended 1975) to exclude maerl bed communities from the boundary of the Fal Fishery Order 2016. Appropriate signage in the form of a yellow buoy clearly delineates the northern and eastern boundaries of the Exclusion Zone. However, fragments of live maerl were recorded in eight sites within the Fal Oyster Survey 2019. At seven of these sites there was one fragment of live maerl and one site which had five fragments (Jenkin *et al.,* 2019). Low amounts of dead maerl fragments were recorded at 11 sites during the survey. Most of the fragments were recorded in the southern part of the Fishery. During the Fal Oyster Survey 2020 live maerl (seven fragments) was recorded at one site and fragments of dead maerl were recorded at 10 sites (Jenkin *et al.,* 2020). This year (2022) live maerl (one fragment) was recorded at one site and fragments of dead maerl were recorded at six sites which can be seen in Annex Figure C (Jenkin *et al.,* 2022). The area in and around the exclusion zone was last surveyed in July 2017 when 14 tows were carried out (Davies *et al.,* 2018). The majority of the habitat recorded consisted of mixed sediment, including maerl, and seagrass	**Changes in suspended solids (water clarity)** See above 'Abrasion/ disturbance of the substrate on the surface of the seabed' mitigation measures (Page 60).	**Changes in suspended solids (water clarity)** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
				was found to be patchy when recorded. Live maerl was recorded outside of the exclusion zone. The recent Fal and Helford SAC Condition Assessment (Natural England, 2020) has identified the maerl beds as unfavourable due historical extraction and dredging, and on-going anchoring of commercial vessels. LOW EXPOSURE		
				Smothering and siltation rate changes (Light) Resistance: None Resilience: Very low Sensitivity: High (Perry *et al*., 2018). Maerl beds are not within the fishery limit. The southern limit of the Fal Fishery was changed from the previous limit within the Truro Port Fishery Regulating Order (1936 amended 1975) to exclude maerl bed communities from the boundary of the Fal Fishery Order 2016. Appropriate signage in the form of a yellow buoy clearly delineates the northern and eastern boundaries of the Exclusion Zone. However, fragments of live maerl were recorded in eight sites within the Fal Oyster Survey 2019. At seven of these sites there was one fragment of live maerl and one site which had five fragments (Jenkin *et al.,* 2019). Low amounts of dead maerl fragments were recorded at 11 sites during the survey. Most of the fragments were recorded in the southern part of the Fishery. During the Fal Oyster Survey 2020 live maerl (seven fragments) was recorded at one site and fragments of dead	**Smothering and siltation rate changes (Light)** See above 'Abrasion/ disturbance of the substrate on the surface of the seabed' mitigation measures (Page 60).	**Smothering and siltation rate changes (Light)** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
				maerl were recorded at 10 sites (Jenkin *et al.,* 2020). This year (2022) live maerl (one fragment) was recorded at one site and fragments of dead maerl were recorded at six sites which can be seen in Annex Figure C (Jenkin *et al.,* 2022). The area in and around the exclusion zone was last surveyed in July 2017 when 14 tows were carried out (Davies *et al.,* 2018). The majority of the habitat recorded consisted of mixed sediment, including maerl, and seagrass was found to be patchy when recorded. Live maerl was recorded outside of the exclusion zone. The recent Fal and Helford SAC Condition Assessment (Natural England, 2020) has identified the maerl beds as unfavourable due historical extraction and dredging, and on-going anchoring of commercial vessels. LOW EXPOSURE		
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) **Estuaries;** Atlantic salt meadows	**Distribution of the feature, including associated transitional habitats, within the site** **Distribution: presence and spatial distribution**	**Maintain** the range and continuity of the habitat and its natural transitions within saltmarsh types and to other habitats seaward and landward **Restore** the presence and spatial distribution	Operation: FISHING Activity **DREDGES** **Litter**	**Litter** The areas of saltmarsh located within the limits of the Fal Fishery Order 2016 are not targeted by dredges. NO EXPOSURE	**Litter** N/A	**Litter** **NO**
			Operation: FISHING Activity **SHORE-BASED ACTIVITIES** **Abrasion/ disturbance of**	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion**	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the**	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
	of biological communities **Extent and distribution** **Extent of the feature within the site** **Structure and function: presence and abundance of key structural and influential species**	of estuary communities **Maintain** the total extent and spatial distribution of the estuary to ensure no loss of integrity, whilst allowing for natural change and succession **Maintain** the total extent of the feature. [**Maintain OR Restore**] the abundance of the species listed to enable each of them to be a viable component of the Annex I habitat feature [**Maintain** OR **Recover** OR **Restore**] the abundance of listed typical species, to enable	**the substrate on the surface of the seabed** **Habitat structure changes - removal of substratum (extraction)** **Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** **Litter**	The areas of saltmarsh located within the limits of the Fal Fishery Order 2016 are not targeted by licenced hand gatherers. NO EXPOSURE	**surface of the seabed, including abrasion** N/A	**disturbance of the substratum below the surface of the seabed, including abrasion** **NO**
				Habitat structure changes - removal of substratum (extraction) Hand-gatherers in the fishery only target certain bivalve and gastropod shellfish species and no intertidal substrate is removed during this process. The areas of saltmarsh located within the limits of the Fal Fishery Order 2016 are not targeted by licenced hand gatherers. NO EXPOSURE	**Habitat structure changes** N/A	**Habitat structure changes** **NO**
				Litter The areas of saltmarsh located within the limits of the Fal Fishery Order 2016 are not targeted by licenced hand gatherers. NO EXPOSURE	**Litter** N/A	**Litter** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
	Structure: species composition of component communities	each of them to be a viable component of the habitat. **Restore** the [Estuary] species composition of component communities				
Estuaries; Intertidal coarse sediment, Intertidal mixed sediments, Intertidal mud, Intertidal sand and muddy sand **Large shallow inlets and bays (LSIB);** Intertidal coarse sediment, Intertidal sand and muddy sand Intertidal rock **Mudflats and sandflats not covered by**	**Distribution: presence and spatial distribution of biological communities**	**Maintain** the presence and spatial distribution of [Mudflats and sandflats] communities **Restore** the presence and spatial distribution of [Estuary/ LSIB/ Subtidal sandbank/ Reefs] communities **Maintain** the presence and spatial distribution of [intertidal coarse sediment/ intertidal mixed sediment/ intertidal mud/ intertidal sand and	Operation: FISHING Activity **SHORE-BASED ACTIVITIES** **Abrasion/ disturbance of the substrate on the surface of the seabed** **Habitat structure changes - removal of substratum (extraction)** **Penetration and/or disturbance of the substratum below the surface of the seabed,**	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** The Fal Fishery falls within part of the SAC, the Fishery limits can be seen in Figure 1 (Section 6.3.2). The species targeted by hand gathering are namely native oysters, mussels, pacific oysters and winkles. Other species such as cockles, scallops, queen scallops and whelks are also taken. The shellfish totals removed by hand-gathering can be seen in Table 3. Hand-gathering only takes place on spring low tides when the target species are exposed. Hand gathering generally occurs over lay areas for native oysters. Elsewhere in the fishery, hand-gatherers mainly collect oysters and queen scallops from Turnaware. Winkles are collected from accessible intertidal rock with algal cover.	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** Under requirements of the Habitats Directive Natural England conduct on-going condition monitoring on the features/sub-features of the SAC, reporting to European Commission every six years. Natural England's condition monitoring provides evidence for the condition of the site features within the SAC. Monitoring of effort via monthly catch statistics is in place.	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
seawater at low tide Intertidal coarse sediment, Intertidal mixed sediments, Intertidal mud, Intertidal sand and muddy sand **Reefs;** Intertidal rock	**Extent and distribution**	muddy sand] communities **Maintain** the presence and spatial distribution of [intertidal rock] communities **Maintain** the total extent and spatial distribution of the [Estuary/ LSIB/ Mudflats and sandflats] to ensure no loss of integrity, whilst allowing for natural change and succession **Maintain** the total extent, spatial distribution and types of [Reefs] (and each of its sub-features), subject to natural variation in sediment veneer **Maintain** the total extent and spatial distribution of [intertidal coarse sediment/ intertidal mixed	**including abrasion**	Year-round intertidal hand gathering of bivalve and gastropod species by license holders is permitted while the dredge is not in use. It is however, an offence under the Shellfish Act 1967 to sell native oysters between 14th of May and the 4th of August in any year. The fishery is restricted to certain times of day within the open period; between the hours of 09:00 and 15:00 Monday to Friday and between the hours of 09:00 and 13:00 on a Saturday. No fishing is permitted on Sundays. LOW EXPOSURE	For total hand-gathering hours a trigger was set for 550 hours. This number was selected from using the highest landings (native oysters and mussels combined – 13,817 kg for October to March 2017-18) and rounded up to allow some flexibility for the next fishery season. A total of 116 hand gathering hours were reported for October 2021 to March 2022. This is a slight under representation of the actual value due to missing attribute data. This is from where gear, number of licences or hours fished were not advised on the returns forms for 612 kg native oysters removed from lay area, 260 kg mussels and 120 kg winkles. Additionally, 14% of returns for October to March are currently missing from licence holders. Missing returns from licence holders will be submitted by the end of the season (September 2022). Progress still needs to be made on missing gear type,	

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
		sediment/ intertidal mud/ intertidal sand and muddy sand]. **Maintain** the total extent and spatial distribution of [intertidal rock], subject to natural variation in sediment veneer. [**Maintain** OR **Recover** OR **Restore**] the abundance of listed typical species, to enable each of them to be a viable component of the habitat. **Maintain** [LSIB/ Reefs] the species composition of component communities **Restore** [Estuary/ Mudflats and sandflats/ Subtidal sandbank] the			number of licences or hours fished on returns forms. Under Article 7 of the Order, the number of hand gatherers permitted to remove shellfish from the fishery is limited to the number of dredge licences issued and provided the dredge is not in use at the time. A total of 71 dredge licences was set as a revised trigger for operational dredges as an indicator of effort. This number was calculated by using the highest number of dredge licences issued over 2014-15 to 2016-17 fishery seasons plus 20% (59 dredge licences in 2016-17). In 2021-22 fishery season, there were 42 dredge licences (plus one hand gathering licence). Cornwall IFCA officers monitor the fishery through boarding's of vessels at sea, inspections of harvesting and lay areas and quayside inspections of landings.	
	Structure and function: presence and abundance of key structural and influential species **Structure: species composition of component communities**					

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
		species composition of component communities **Maintain** [intertidal mud] the species composition of component communities. **Restore** [intertidal coarse sediment/ intertidal mixed sediment/ intertidal sand and muddy sand] the species composition of component communities. **Maintain** [intertidal rock] the species composition of component communities.			Should dredge licence numbers exceed 71, hand-gathering hours exceed 550 (March to October), or an adverse effect or a risk of adverse effect on the features/sub-features arise, re-assessment and mitigation measures will be implemented if necessary (See Section 17/ Annex 4). This assessment is also subject to annual review. NO ADDITIONAL MITIGATION MEASURES ARE NECESSARY	
				Habitat structure changes - removal of substratum (extraction) Hand-gatherers in the fishery only target certain bivalve and gastropod shellfish species and no intertidal substrate is removed during this process. Target species such as oysters and queen scallops are removed from the cultch. NO EXPOSURE	**Habitat structure changes** N/A	**Habitat structure changes** **NO**
Estuaries; Subtidal seagrass beds **Large shallow inlet and bays;** Subtidal seagrass beds	**Distribution: presence and spatial distribution of biological communities**	**Maintain** the presence and spatial distribution of [Mudflats and sandflats] communities **Restore** the presence and spatial distribution	Operation: FISHING Activity **SHORE-BASED ACTIVITIES** **Abrasion/ disturbance of the substrate**	**Abrasion/ disturbance of the substrate on the surface of the seabed** Resistance: Low Resilience: Medium Sensitivity: Medium (D'Avack *et al*., 2020). **AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion**	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion**	**Abrasion/ disturbance of the substrate on the surface of the seabed AND Penetration and/or disturbance of**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
Mudflats and sandflats not covered by seawater at low tide Intertidal seagrass beds **Sandbanks which are slightly covered by sea water all the time;** Subtidal seagrass beds	**Extent and distribution**	of [Estuary/ LSIB/ Subtidal sandbanks] communities **Maintain** the presence and spatial distribution of intertidal seagrass bed communities **Restore** the presence and spatial distribution of subtidal seagrass bed communities **Maintain** the total extent and spatial distribution of [Estuary/ LSIB/ Mudflats and sandflats/ Subtidal sandbanks] to ensure no loss of integrity, whilst allowing for natural change and succession **Maintain** the total extent and spatial distribution of [intertidal] seagrass beds.	**on the surface of the seabed** **Habitat structure changes - removal of substratum (extraction)** **Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion**	Resistance: None Resilience: Low Sensitivity: High (D'Avack *et al*., 2020). Intertidal seagrass is found in the upper Fal. Two beds are in close proximity to each other, located near to Ardevora within the Fal-Ruan Estuary Nature Reserve (Environment Agency (EA), 2014). *Zostera noltii* beds in littoral muddy sand' (A2.6111) is the only intertidal seagrass biotope present (Natural England, 2022). A small bed of subtidal seagrass lies south of Penarrow Point which is included in the boundary of the Fal Fishery order 2016. '*Zostera marina* beds on lower shore or infralittoral clean or muddy sand' (A5.5331) is the biotope for the subtidal feature within the site (Natural England, 2022). Hand-gathering only takes place on spring low tides when the target species are exposed. The areas of seagrass located within the limits of the Fal Fishery Order 2016 are not targeted by licenced hand gatherers. The recent Fal and Helford SAC Condition Assessment (Natural England, 2020) has identified the subtidal seagrass beds as unfavourable due to anchoring and mooring. LOW EXPOSURE	Under requirements of the Habitats Directive Natural England conduct on-going condition monitoring on the features/sub-features of the SAC, reporting to European Commission every six years. Natural England's condition monitoring provides evidence for the condition of the site features within the SAC. Cornwall IFCA will continue to monitor the seagrass beds within the Fal Fishery area as part of routine monitoring. If an adverse effect or a risk of adverse effect on the features/sub-features arise, re-assessment and mitigation measures will be implemented if necessary (See Section 17/ Annex 4). This assessment is also subject to annual review. NO ADDITIONAL MITIGATION MEASURES ARE NECESSARY	**the substratum below the surface of the seabed, including abrasion** **NO**
				Habitat structure changes - removal of substratum (extraction) Resistance: None Resilience: Very low Sensitivity: High (D'Avack *et al*., 2020).	**Habitat structure changes** N/A	**Habitat structure changes** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
	Extent of supporting habitat **Structure and function: presence and abundance of key structural and influential species** **Structure: biomass**	**Restore** the total extent and spatial distribution of [subtidal] seagrass beds. **Maintain** the area of habitat which is likely to support the subfeature. [**Maintain** OR **Restore**] the abundance of listed typical species, to enable each of them to be a viable component of the habitat **Maintain** the [intertidal seagrass] and **Restore** the [subtidal seagrass] leaf / shoot density, length, percentage cover, and rhizome mat across the feature at natural levels		Hand-gatherers in the fishery only target certain bivalve and gastropod shellfish species and no intertidal substrate is removed during this process. The areas of seagrass located within the limits of the Fal Fishery Order 2016 are not targeted by licenced hand gatherers. NO EXPOSURE		

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
		(as far as possible), to ensure a healthy, resilient habitat.				
	Structure: rhizome structure and reproduction	**Maintain** the [intertidal seagrass] and **Restore** the [subtidal seagrass] extent and structure of the rhizome mats across the site, and conditions to allow for regeneration of seagrass beds.				
	Structure: species composition of component communities	**Maintain** [LSIB] the species composition of component communities **Restore** [Estuary/ Mudflats and Sandflats/ Subtidal sandbanks] the species composition of component communities				

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
		Maintain [intertidal and subtidal seagrass beds] the species composition of component communities				
Features: **Estuaries;** **Large shallow inlet and bays;** **Mudflats and sandflats not covered by seawater at low tide** **Reefs;** **Sandbanks which are slightly covered by sea water all the time;** **Sub-features:** Intertidal mixed sediments Intertidal mud Intertidal sand and muddy sand	**Distribution: presence and spatial distribution of biological communities**	**Maintain** the presence and spatial distribution of [Mudflats and sandflats] communities **Restore** the presence and spatial distribution of [Estuary/ LSIB/ Subtidal sandbank/ Reefs] communities **Maintain** the presence and spatial distribution of [intertidal mixed sediment/ intertidal mud/ intertidal sand and muddy sand/ subtidal coarse sediment/ subtidal sand/ subtidal mud/ intertidal seagrass bed/ intertidal rock/	Operation: FISHING Activity **SHORE-BASED ACTIVITIES** and **DREDGES** **Removal of non-target species**	**Removal of non-target species** Cornwall IFCA carries out annual monitoring of the fishery during a survey which is normally carried out in January each year. The survey monitors the stock of oysters, queen scallops and records the presence of non-natives. A list of by-catch was recorded during the Cornwall IFCA 2019 oyster survey which was carried out by dredge (Jenkin *et al.,* 2019; Section 3.6 and Annex 6 within report). This was not a primary objective of the survey and the list should not be considered definitive. Arthropods and molluscs were the most commonly observed families in the bycatch. Six species of crab were regularly seen; common shore crab (*Carcinus maenas*), navigator crab (*Liocarcinus navigator*), harbour crab (*Liocarcinus depurator*), long-legged spider crab (*Macrapodia* sp.), hermit crab (*Pagurus bernhardus*) and long-clawed porcelain crab (*Pisidia longicornis*). Of these, the navigator crab and hermit crab were particularly noticeable, recorded in 54 and 51 of the 83 dredge samples respectively. Commonly seen molluscs included; slipper limpets (*Crepidula fornicata*), saddle oysters (*Anomia ephippium*), topshells (*Gibbula* spp.),	**Removal of non-target species** All non-target species are returned to sea (except slipper limpets and pacific oysters). Cornwall IFCA officers monitor the fishery through boarding's of vessels at sea, inspections of harvesting and lay areas and quayside inspections of landings. The licence holders must submit information to Cornwall IFCA, which includes the weight in kilograms of shellfish (oysters (*O. edulis),* mussels (*Mytilus* spp). and other bivalve or gastropod shellfish) landed or removed from the fishery, the weight in kilograms of discarded shellfish, the areas fished, the fishing method used, the gear type	**Removal of non-target species** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
Subtidal mixed sediments Subtidal mud Subtidal sand Subtidal coarse sediment Intertidal seagrass beds Subtidal seagrass beds Intertidal rock Infralittoral rock Circalittoral rock Maerl beds Atlantic salt meadows	**Structure and function: presence and abundance of key structural and influential species** **Structure: species composition of component communities**	infralittoral rock/ maerl bed] communities **Restore** the presence and spatial distribution of [subtidal mixed sediment/ subtidal seagrass bed / circalittoral rock] communities **[Maintain** OR **Recover** OR **Restore**] the abundance of listed typical species, to enable each of them to be a viable component of the habitat. **Maintain** [LSIB/ Reefs] the species composition of component communities **Restore** [Estuary/ Mudflats and sandflats/ Subtidal sandbank] the species composition of		chitons (*Lepidochitona cinerea*), mussels (*Mytulis edulis*) and spiral shells (*Turitella / Bittium* sp.). Two species of red algae; coralline algae (*Lithophyllum* sp.) (which was likely under-recorded) and red string weed (*Soliera chordalis*) were also commonly seen. Sponges were noticeable throughout the survey, but often couldn't be identified to species level and will therefore be under-reported. One particular species that was under-recorded is *Suberites ficus*, seen as an orange layer on the shells of scallops, but only positively identified on the final day. The most notable species recorded was a short snouted seahorse (*Hippocampus hippocampus*). This species hadn't been recorded by Cornwall IFCA during a survey previously and only one official record exists for the Fal estuary, with another diver record confirmed (pers. comms, Natural England). It was noted by Cornwall IFCA officers that by-catch appeared to be in a good condition, and species such as the delicate long legged spider crab (*Macropodia rostrate)* were unharmed by the dredge. In the fishery, upon hauling, fishers sort the dredge contents (cultch), and select target species of size to retain and the rest of the dredge contents (including by-catch) is returned to sea immediately. There should be no removal of non-target species by hand gatherers as their catch should be targeted. LOW EXPOSURE	and quantity used, the type of vessel used and the number of person fishing under the licence. The information provided by the licence holder will be analysed by Cornwall IFCA officers along with the results of the Fal Oyster Survey annually to monitor the impact to the fishery. Should dredge licence numbers exceed 71, dredge hours exceed 17,500, hand-gathering hours exceed 550 (March to October), or an adverse effect or a risk of adverse effect on the features/sub-features arise, re-assessment and mitigation measures will be implemented if necessary (See Section 17/ Annex 4). This assessment is also subject to annual review. NO ADDITIONAL MITIGATION MEASURES ARE NECESSARY	

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
		component communities **Maintain** [intertidal mud/ subtidal sand/ subtidal mixed sediments/ subtidal coarse sediment/ intertidal and subtidal seagrass beds/ intertidal rock/ infralittoral rock/ circalittoral rock] the species composition of component communities. **Restore** [intertidal mixed sediment/ intertidal sand and muddy sand/ subtidal mud/ maerl beds] the species composition of component communities.				
Features: **Estuaries;** **Large shallow inlet and bays;** **Mudflats and sandflats not covered by**	**Distribution: presence and spatial distribution of biological communities**	**Maintain** the presence and spatial distribution of [Mudflats and sandflats] communities **Restore** the presence and	Operation: FISHING Activity **SHORE-BASED ACTIVITIES** and **DREDGES**	**Removal of target species** A number of species are targeted by the fishery. The main species include the native oyster (*O. edulis*), mussels (*Mytilus* spp.) and queenies which include the queen scallop, *Aequipecten opercularis* and the variegated scallop, *Mimachlamys varia.*	**Removal of target species** Only licence holders are permitted to remove shellfish species such as native oysters, queen	**Removal of target species** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
seawater at low tide **Reefs;** **Sandbanks which are slightly covered by sea water all the time;** **Sub-features:** Intertidal mixed sediments Intertidal mud Intertidal sand and muddy sand Subtidal mixed sediments Subtidal mud Subtidal sand Subtidal coarse sediment Intertidal seagrass beds Subtidal seagrass beds Intertidal rock Infralittoral rock Circalittoral rock	**Structure and function: presence**	spatial distribution of [Estuary/ LSIB/ Subtidal sandbank/ Reefs] communities **Maintain** the presence and spatial distribution of [intertidal mixed sediment/ intertidal mud/ intertidal sand and muddy sand/ subtidal coarse sediment/ subtidal sand/ subtidal mud/ intertidal seagrass bed/ intertidal rock/ infralittoral rock] communities **Restore** the presence and spatial distribution of [subtidal mixed sediment/ subtidal seagrass bed / circalittoral rock] communities **[Maintain** OR **Recover** OR **Restore**] the abundance of listed typical	**Removal of target species**	Previously, in the Fal Fishery Order 2016, a person that retained on board or landed native species of bivalve or gastropod shellfish had to ensure that the combined weight of species other than oysters (*O. edulis*) and mussels (*M. edulis*) did not exceed 20% of the weight of all the native species retained on board or landed. In the Fal Fishery Order 2016 this regulation was removed in 2017 which has changed queen scallops to a target species. Analysis of the 2021-22 licence holder returns data shows approximately 63,152 kg of queen scallops were landed by dredging compared to 12,435 kg of native oysters landed for sale (Table 7). Since 2017-18 season, there have been issues with the market for native oysters. The production of oysters in Europe, mainly in France has been very successful over the last couple of years meaning the supply is good weakening the demand for oysters from the UK and their value is low. A 70 g minimum weight was also applied by the merchants, likely due to oysters being sent to restaurants and not relay markets. In February and March 2020 the fishery was impacted by limited export of shellfish outside of UK and local restrictions due to COVID-19. Then the market was impacted further in January to March 2021 by limited to no export of shellfish outside of the UK after Brexit. During the 2021-2022 season the market for native oysters locally remains supressed. Previously, with the reduction in market for native oysters or if fishable stocks were low,	scallops and mussels from the fishery. The change in regulations to allow other queen scallops to become target species and no longer consider them to be by-catch has increased the amount of shellfish which is removed from the fishery. Additionally, this has also resulted in an increase in the level of dredging effort directed towards the fishery. However, the closed season and specific days and times the fishermen are permitted to remove shellfish will not change, therefore the effort is likely to remain the same (depending on the number of dredge licences issued this year). Cornwall IFCA officers monitor the fishery through boarding's of vessels at sea, inspections of harvesting and lay areas and quayside inspections of landings. All oysters and mussels landed and stored in the Fal fishery area must be in bags labelled with a	

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
	and abundance of key structural and influential species **Structure: species composition of component communities**	species, to enable each of them to be a viable component of the habitat. **Maintain** [LSIB/ Reefs] the species composition of component communities **Restore** [Estuary/ Mudflats and sandflats/ Subtidal sandbank] the species composition of component communities **Maintain** [intertidal mud/ subtidal sand/ subtidal mixed sediments/ subtidal coarse sediment/ intertidal and subtidal seagrass beds/ intertidal rock/ infralittoral rock/ circalittoral rock] the species composition of		effort (in terms of dredge hours) would have reduced as it would have not been economical viable to continue dredging. However, it appears that fishing effort has continued and been directed towards queen scallops. Long *et al.* (2017) described that the Fal Oyster Fishery's longevity may be due to the fishery's inefficient capture method which ensures a low CPUE and effort would decrease before over-exploitation of native oysters occurred allowing stock recovery. However, effort is not influenced by the abundance of native oysters now that queen scallops are a target species. This season and for the 2020-21 and 2019-20 season, fishing effort has been significantly lower compared to the previous six seasons. The total native oysters placed on lays between October and March 2021-22 was 3,447 kg and 1,105 kg removed from lays (Section 6.4.4; Table 10The weight of native oysters fished (by both dredging and hand gathering) and placed on lay areas were kept separate as these remained within the Fishery. The total weight of native oysters placed onto lays can be seen in Table 10. Table 10). These totals for lays include dredging and hand gathering. Hand-gathering only takes place on spring low tides when the target species are exposed. The shellfish totals removed by hand-gathering can be seen in Table 5. The species targeted	numbered tag attributable to the permit holder. The licence holders must submit information to Cornwall IFCA, which includes the weight in kilograms of shellfish (oysters (*O. edulis),* mussels (*Mytilus* spp). and other bivalve or gastropod shellfish) landed or removed from the fishery, the weight in kilograms of discarded shellfish, the areas fished, the fishing method used, the gear type and quantity used, the type of vessel used and the number of person fishing under the licence. The information provided by the licence holder will be analysed by Cornwall IFCA officers along with the results of the Fal Oyster Survey annually to monitor the impact to the fishery. Should dredge licence numbers exceed 71, dredge hours exceed 17,500, hand-gathering hours exceed 550 (March to October), or an adverse effect or a risk of adverse effect on the features/sub-features arise, re-	

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
		component communities. **Restore** [intertidal mixed sediment/ intertidal sand and muddy sand/ subtidal mud] the species composition of component communities.		by hand gathering are namely native oysters, mussels, pacific oysters and winkles. Other species such as cockles, scallops, queen scallops and whelks are also taken. A species which is now considered a target species is the Pacific oyster (*Magallana gigas*). Under Regulation 6 of the Fal Fishery Order 2016 any that are retained on board a vessel or in any container must not be returned to the fishery. Totals for 2021-22 season are not yet complete but 98 kg of pacific oysters have been landed so far from October 2021 to March 2022. The total weight of pacific oysters landed has increased since the 2017-18 season, this is likely due to a more directed fishery in recent years with a market for pacific oysters. Additionally, the change in the Regulations in 2017 to not return pacific oysters the to the Fishery once caught would have influenced the landings. The minimum sizes for the three main target species are; Native oyster (*O. edulis)*: when laid flat will not pass through a circular aperture of 67 mm diameter (Regulation 2, Fal Fishery Order 2016) Mussels (*Mytilus* spp.): 50 mm in length (Regulation 3, Fal Fishery Order 2016) Queen scallop (*Chlamys* spp.): 40 mm (Council Regulation 850/98 Annex XII) the minimum conservation reference size (MCRS) of queen scallops (*Chlamys* spp.) is 40 mm under	assessment and mitigation measures will be implemented if necessary (See Section 17/ Annex 4). This assessment is also subject to annual review. NO ADDITIONAL MITIGATION MEASURES ARE NECESSARY	

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
				Council Regulation 1241/19 Annex VI[20]. Due to the nature of the vessels targeting the fishery, they are not subject to the MCRS for *Chlamys* spp. as this applies to commercial fishing vessels that are registered and licensed. LOW EXPOSURE		
Features: **Estuaries;** **Large shallow inlet and bays;** **Mudflats and sandflats not covered by seawater at low tide** **Reefs;** **Sandbanks which are slightly covered by sea water all the time;** **Sub-features:** Intertidal mixed sediments Intertidal sand and muddy sand Subtidal mixed sediments	**Supporting processes: water quality - dissolved oxygen**	**Maintain** the dissolved oxygen concentration at levels equating to High Ecological Status[(specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year)], avoiding deterioration from existing levels**.**	Operation: FISHING Activity **SHORE-BASED ACTIVITIES** and **DREDGES** **Deoxygenation**	**Deoxygenation** No potential for deoxygenation to be caused due to oyster dredging and hand gathering activities within the SAC. NO EXPOSURE	**Deoxygenation** N/A	**Deoxygenation** **NO**

[20] Regulation (EU) 2019/1241 of the European Parliament and of the Council. Available from: https://www.legislation.gov.uk/eur/2019/1241/annex/VI [Accessed: 27/09/2022].

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
Subtidal mud Subtidal sand Subtidal coarse sediment Intertidal rock Infralittoral rock Circalittoral rock Maerl beds						
Features: **Estuaries;** **Large shallow inlet and bays;** **Mudflats and sandflats not covered by seawater at low tide** **Reefs;** **Sandbanks which are slightly covered by sea water all the time;** **Sub-features:** Intertidal sand and muddy sand Subtidal sand Subtidal coarse sediment	**Supporting processes: light levels**	**Maintain** the natural light availability	Operation: FISHING Activity **SHORE-BASED ACTIVITIES** and **DREDGES** **Introduction of light**	**Introduction of light** The fishery is restricted to certain times of day within the open period; between the hours of 09:00 and 15:00 Monday to Friday and between the hours of 09:00 and 13:00 on a Saturday. No fishing is permitted on Sundays. The Fal Fishery is only permitted to operate during daylight hours therefore there is no need for additional light sources to be used in this fishery. NO EXPOSURE	**Introduction of light** N/A	**Introduction of light** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
Intertidal seagrass beds Subtidal seagrass beds Intertidal rock Infralittoral rock Maerl beds						
Features: **Estuaries;** **Large shallow inlet and bays;** **Mudflats and sandflats not covered by seawater at low tide** **Reefs;** **Sandbanks which are slightly covered by sea water all the time;** **Atlantic salt meadows;** **Sub-features:** Intertidal mixed sediments Intertidal mud Intertidal sand and muddy sand	**Structure: non-native species and pathogens**	**Reduce** the introduction of non-native species and pathogens, and their impacts.	Operation: FISHING Activity **DREDGES** **Introduction of microbial pathogens**	**Introduction of microbial pathogens** Bivalve parasites such as *Marteilia refringens* and *Bonamia ostreae* can devastate populations of species such as *O. edulis* with diseases marteiliosis and bonamiosis. The first recorded incidence of *B. ostreae* in the British Isles occurred in 1982 in the River Fal and caused large mortalities in the oyster stocks. The Fal is a Confirmed Designation number CD Area 01 (2015 v.2) for the control of *Bonamia ostreae* (Cefas, 2015). This designation issued under the Aquatic Animal Health (England and Wales) Regulations 2009 restricts the movement of any oysters from within the designated area without the prior written consent of the Fish Health Inspectorate at Cefas. Cefas undertook disease surveillance sampling of 150 *0. edulis* individuals within the Fal Estuary in 2020. Of these seven individuals tested positive for *Bonamia ostreae* (five from Messack, one from Truenaware point and one from Ruan Creek. *B. ostreae* is a microscopic single-celled parasite from the phylum Haplosporidia. It has no impact on other shellfish or on human health and does not	**Introduction of microbial pathogens** Cornwall IFCA have a biosecurity plan for the Fal Fishery. The plan contains identified risks to the fishery, mitigation of the identified risks, a monitoring plan and a contingency plan. NO ADDITIONAL MITIGATION MEASURES ARE NECESSARY	**Introduction of microbial pathogens** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
Subtidal mixed sediments Subtidal mud Subtidal sand Subtidal coarse sediment Intertidal seagrass beds Subtidal seagrass beds Intertidal rock Infralittoral rock Circalittoral rock Atlantic salt meadows				affect the taste of oysters in anyway or pose a health risk to a consumer. However, it can result in significant mortalities in affected oyster stocks of up to 90% mortality when initially introduced (Culloty and Mulcahy, 2007). It is transmitted through proximity and there is currently no known treatment (Cefas, 2005). The samples were negative for *Marteilia refringens* and *Bonamia exitiosa*. The main level of control in preventing the disease spreading is by restricting live movements between stocks. Under Regulation 10, a person must not deposit any shellfish within the fishery area, where such shellfish originated from outside the fishery area, without authorisation from the Authority. LOW EXPOSURE		
Features: **Estuaries;** **Large shallow inlet and bays;** **Mudflats and sandflats not covered by seawater at low tide** **Reefs;** **Sandbanks which are slightly covered by sea**	**Structure: non-native species and pathogens**	**Reduce** the introduction of non-native species and pathogens, and their impacts.	Operation: FISHING Activity **SHORE-BASED ACTIVITIES** and **DREDGES** **Introduction or spread of non-indigenous species**	**Introduction or spread of non-indigenous species** Commercial fishing vessels are predominantly local vessels, using gear within a geographically restricted area. From the licence holder returns (Table 4.), the 2019-20 season saw the most Pacific oysters reported to be landed and removed from the fishery (10,213 kg). Totals for 2020-21 season were 492 kg and for this season (2021-22) 135 kg of pacific oysters have been landed so far from October 2020 to March 2021. The total weight of pacific oysters landed has increased since the 2017-18 season, this is likely due to a more directed fishery in recent years with a market for pacific oysters.	**Introduction or spread of non-indigenous species** Cornwall IFCA have a biosecurity plan for the Fal Fishery. The plan contains identified risks to the fishery, mitigation of the identified risks, a monitoring plan and a contingency plan. The vessels and gear for this fishery remain in a relatively small area reducing the risk of non-natives.	**Introduction or spread of non-indigenous species** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
water all the time; **Atlantic salt meadows;** **Sub-features:** Intertidal mixed sediments Intertidal mud Intertidal sand and muddy sand Subtidal mixed sediments Subtidal mud Subtidal sand Subtidal coarse sediment Intertidal seagrass beds Subtidal seagrass beds Intertidal rock Infralittoral rock Circalittoral rock Maerl beds Atlantic salt meadows				Additionally, the change in the Regulations in 2017 to not return pacific oysters the to the Fishery once caught would have influenced the landings. Slipper limpets, *Crepidula fornicate,* is a non-native species listed under Schedule 9 of the Wildlife and Countryside Act 1981 and are prohibited from release into the wild. The weight of slipper limpets removed is also recorded on the licence holder returns forms. This is recorded as 861 kg of slipper limpets in 2021-22 season. For the past five seasons over 55% of slipper limpets removed came from Area A. During Cornwall IFCA surveys the presence of non-native species are recorded as standard (Jenkin *et al.,* 2022; Section 3.4 and 3.6 within report). Three non-native species were found during the survey; slipper limpets, *C. fornicata*, leathery sea-squirts, *Styela clava* and one Portuguese oyster (*Crassostrea angulate*). All non-native species found during the survey were retained on board and removed from the fishery. A total of 4,507 slipper limpets were recorded during the 2022 survey. Densities are highest either side of the channel running between the East Bank and North Bank. The total number of slipper limpets were highest in Area A, corresponding with the licence holder returns data. LOW EXPOSURE	NO ADDITIONAL MITIGATION MEASURES ARE REQUIRED	

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
Features: **Estuaries;** **Large shallow inlet and bays;** **Mudflats and sandflats not covered by seawater at low tide** **Reefs;** **Sandbanks which are slightly covered by sea water all the time;** **Sub-features:** Infralittoral rock Intertidal seagrass beds Subtidal seagrass beds	**Supporting processes: water quality - nutrients**	**Maintain** water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels.	Operation: FISHING Activity **DREDGES** **Nutrient enrichment**	**Nutrient enrichment** No potential for nutrient enrichment to be caused due to oyster dredging within the SAC. NO EXPOSURE	**Nutrient enrichment** N/A	**Nutrient enrichment** **NO**
Features: **Estuaries;** **Large shallow inlet and bays;** **Mudflats and sandflats not covered by seawater at low tide**	**Supporting processes: water quality - nutrients**	**Maintain** water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not	Operation: FISHING Activity **DREDGES** **Organic enrichment**	**Organic enrichment** No potential for organic enrichment to be caused due to oyster dredging within the SAC. NO EXPOSURE	**Organic enrichment** N/A	**Organic enrichment** **NO**

Feature(s)/ Sub features(s)	Attribute	Target for relevant attribute based on conservation objectives	Potential pressure(s) (associated impacts in Table 13 and Table 15)	Likelihood of impacts occurring/level of exposure to pressure	Mitigation measures if feature(s) is/are exposed to the pressure	Adverse effect on integrity (AEOI) of the site?
Reefs; **Sandbanks which are slightly covered by sea water all the time;** **Sub-features:** Subtidal mixed sediment Subtidal mud Subtidal sand Subtidal coarse sediment Intertidal seagrass beds Subtidal seagrass beds Intertidal rock Infralittoral rock Circalittoral rock Maerl beds		affect the integrity of the site and features, avoiding deterioration from existing levels.				

10. Conclusion alone[21]

Is there an adverse effect on site integrity (AEOI) of the site?	No
If yes, what feature does this risk apply to?	N/A
Can Cornwall IFCA exercise its functions to further the conservation objectives of the site?	Yes
If yes, what are the options?	Monitor activity levels and review (Sections 14 and 17)

Cornwall IFCA have made this assessment and concluded that there will be no adverse effect of dredging and hand working activities associated with the Fal Fishery Order 2016 on the features of the Fal and Helford SAC alone.

11. In-combination assessment

Oyster dredging and hand working fishing activities currently occur in the SAC alongside other fishing activities, commercial plans or projects and recreational activities; therefore, there is the potential for this activity to have a likely significant effect on site features/ sub-features when combined with other fishing activities, plans or projects and an in-combination assessment is required. To determine which other activities should be included in this assessment, a five square kilometre buffer was applied to the site.

Some licence holders utilise multiple fishing activities (e.g. potting, netting) throughout the year. This may lead to cumulative impacts different to those of a single fishing activity. The in-combination effect with other activities is shown in Table 17.

The Marine Management Organisation's Public Register of Marine Licence Applications (MMO, 2022) was checked (09/08/2022) for developments within the Fal and Helford SAC. All other current plans and projects within the SAC were screened out and considered not likely to impact the features of the SAC in-combination (Table 17). The impact of future plans or projects will require assessment in their own right, including accounting for any in-combination effects, alongside existing activities.

Any activities, including fishing activities and marine works licensed by the MMO within this area were identified. Relevant activities in or close to the SAC are shown in Table 17.

Table 17: Other relevant activities occurring in or close to the site

Plans and Projects			
Activity	**Description**	**Potential Pressure** (Natural England, 2022)	**In-combination effect**
N/A	N/A	N/A	N/A
Other activities being considered (Annex 3)			
Activity	**Description**	**Potential Pressure** (Natural England, 2022)	**In-combination effect?**
Towed demersal trawls and dredges (excluding oyster dredges)	The Cornwall IFCA Closed Areas (European Marine Sites) No. 2 Byelaw prohibits this activity within the Fal and Helford SAC. This removes any potential for an in-combination effect.	Abrasion/disturbance of the substrate on the surface of the seabed Changes in suspended solids (water clarity)	No

[21] If conclusion of adverse effect alone an in-combination assessment is not required (but has been included for 'completeness'.

		Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion Removal of non-target species Removal of target species Smothering and siltation rate changes Deoxygenation Introduction or spread of non-indigenous species Organic enrichment Physical change (to another seabed type)	
Intertidal fishing activities	Cornwall IFCA officers are aware of other intertidal fishing activities occurring within the wider SAC. Hand-gathering is selective and only target species are removed. Abrasion and removal of non-target species are minimal from disturbance of walking to and from the beds. The activity levels of hand-gathering are monitored via monthly catch statistics and at current levels, the in-combination effect is minimal.	Abrasion/disturbance of the substrate on the surface of the seabed Habitat structure changes - removal of substratum (extraction) Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion Removal of target species Removal of non-target species Introduction or spread of non-indigenous species	No
Potting	Pots for crustacea, cuttle pots for cuttlefish and fish traps for wrasse are used within Fal and Helford SAC. Pots targeting crustacea are generally set on the reef/ sediment interface within Fal and Helford SAC. Wrasse are generally targeted on the infralittoral rock sub feature. In many cases the vessels themselves are utilised for multiple fishing activities (e.g. potting, netting and/or lining). The oyster beds are not targeted by pots and traps and fishermen avoid the areas targeted by the oyster fishery to prevent gear becoming tangled. An in-combination effect from potting can be ruled out.	Abrasion/disturbance of the substrate on the surface of the seabed Removal of non-target species Removal of target species Introduction or spread of non-indigenous species Organic enrichment Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	No
Static and passive nets/lines	The use of demersal nets within the SAC is indicated to be low. Nets targeting crustacea are generally set on the edges of rocks and reefs as well as sediment features. In many cases the vessels themselves are utilised for multiple fishing	Abrasion/disturbance of the substrate on the surface of the seabed Removal of non-target species Removal of target species	No

	activities (e.g. potting, netting and/or lining). The use of nets (except ebb nets and sand eel seines under a Cornwall IFCA Permit) within the Fal (upstream of a line drawn from Pendennis Point and Saint Anthony Head) are prohibited by the Cornwall IFCA River and Estuarine Fishing Nets Byelaw 2017. An in-combination effect from netting can be ruled out.	Introduction or spread of non-indigenous species Organic enrichment Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	
Commercial Diving	Due to the low level of commercial diving activities, no in-combination effect is thought to be possible.	Removal of target species Abrasion/disturbance of the substrate on the surface of the seabed Introduction or spread of non-indigenous species Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	No
Pelagic activities	An in-combination effect from pelagic gear, including hand-lining and/or charter angling can be ruled out as these do not interact with the seabed. The use of nets (except ebb nets and sand eel seines under a Cornwall IFCA Permit) within the Fal (upstream of a line drawn from Pendennis Point and Saint Anthony Head) are prohibited by the Cornwall IFCA River and Estuarine Fishing Nets Byelaw 2017. This includes ring nets.	Abrasion/disturbance of the substrate on the surface of the seabed Changes in suspended solids (water clarity) Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion Removal of non-target species Smothering and siltation rate changes Deoxygenation Introduction or spread of non-indigenous species Organic enrichment Physical change (to another seabed type)	No

No adverse effect on the features of the Fal and Helford SAC in-combination.

12. Conclusion in-combination

Cornwall IFCA have made this assessment and concluded that there will be no adverse effect of dredging and hand working activities associated with the Fal Fishery Order 2016 on the features of the Fal and Helford SAC in-combination.

13. Summary of consultation with Natural England

This assessment was sent to Natural England on 12/08/2022 for formal advice. Natural England provided formal advice on 26/09/2022 which has been incorporated into this assessment and can be seen in Annex 5.

14. Management options for all features

Option 1: Current activity levels acceptable, appropriate monitoring and control mechanisms established.

Option 2: Reduce/limit activities.

Option 3: Remove/avoid activities.

For all features of the SAC **Option 1** is the most appropriate option to best further the conservation objectives of the site.

15. Overall conclusion

Cornwall IFCA conclude that there no adverse effect of oyster dredging and hand working at current levels on the features of the Fal and Helford SAC alone or in-combination.

16. Integrity test

It can be concluded that the activities assessed in this HRA, alone or in-combination, do not adversely affect the features of the Fal and Helford SAC and that future activity, at the levels anticipated, will not foreseeably have an adverse effect on the integrity of the site.

17. Adaptive risk review process

Monitoring of dredging and shore-based activities will occur through ongoing surveys, statistics returns, and patrols by Cornwall IFCA. If the number of dredge licences increase above 71, dredging hours increase over 17,500, hand-gathering hours exceed 550 (March to October), or if an adverse effect on the site features is noted, this will trigger a review of the assessment to assess the level and distribution of the activity, current site condition and potential changes to the Regulations and action these as and when necessary and appropriate.

For activities within the SAC, any subsequent evidence gathered would be used to assess the need for further management options which would be subject to scrutiny through Cornwall IFCA's Byelaw working group and full committee. Any management options decided through this process would be subject to public consultation.

The Fal Fishery Management Committee (FFMC) exists to discuss improvement and management matters for oysters and mussels within the regulated fishery and make recommendations to Cornwall IFCA. FFMC includes representatives from the fishing and merchanting sectors, as well as from other relevant regulatory organisations. Its members provide detailed, expert input into the ongoing management process and help with the development of any new measures.

This process is illustrated in Annex 4.

18. Management Plan

Under the Fal Fishery Order 2016 Article 3 enquires the Authority to publish and review its management plan for the fishery. The purpose of this plan, which is reviewed annually following consultation with interested parties, is to set out the objectives for the fishery and actions for the following year. Please refer

to the 'Fal Fishery Order Management Plan 2020-21' for more details[22]. The Fal Fishery Order Management Plan 2020-21 is still valid as no changes were considered necessary for 2022-23 season.

[22] The Fal Fishery Order Management Plan 2020-21 available from: https://secure.toolkitfiles.co.uk/clients/17099/sitedata/Fal_Fishery/Fal-Fishery-Order-Managment-Plan-2020-21.pdf [Accessed 09/08/2022]

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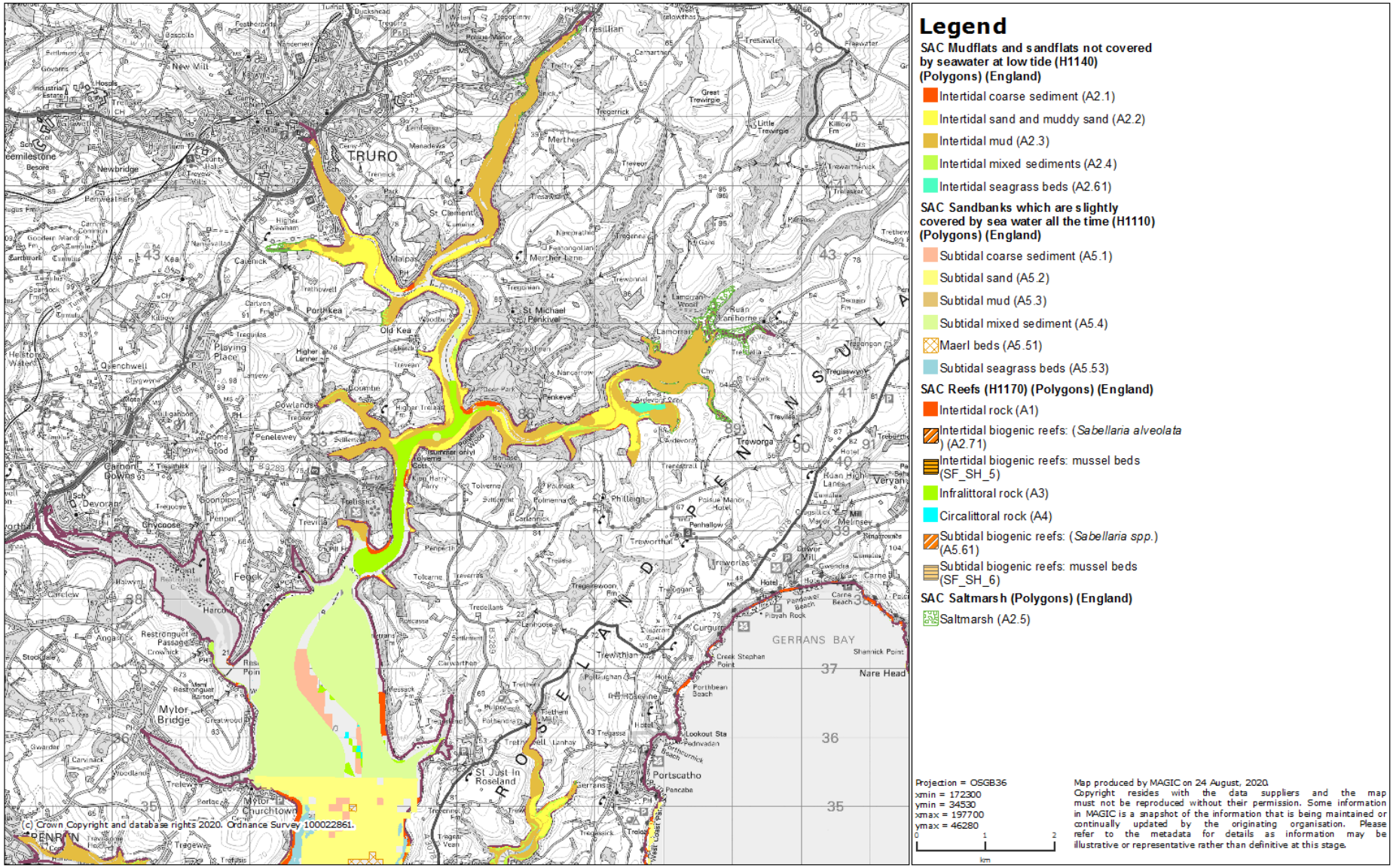
Wildfowl and Wetlands Trust (WWT) Consulting. 2012. Review of the impacts of fisheries on marine birds with particular reference to Wales. Marine Spatial Planning in Wales Project.: Countryside Council for Wales.

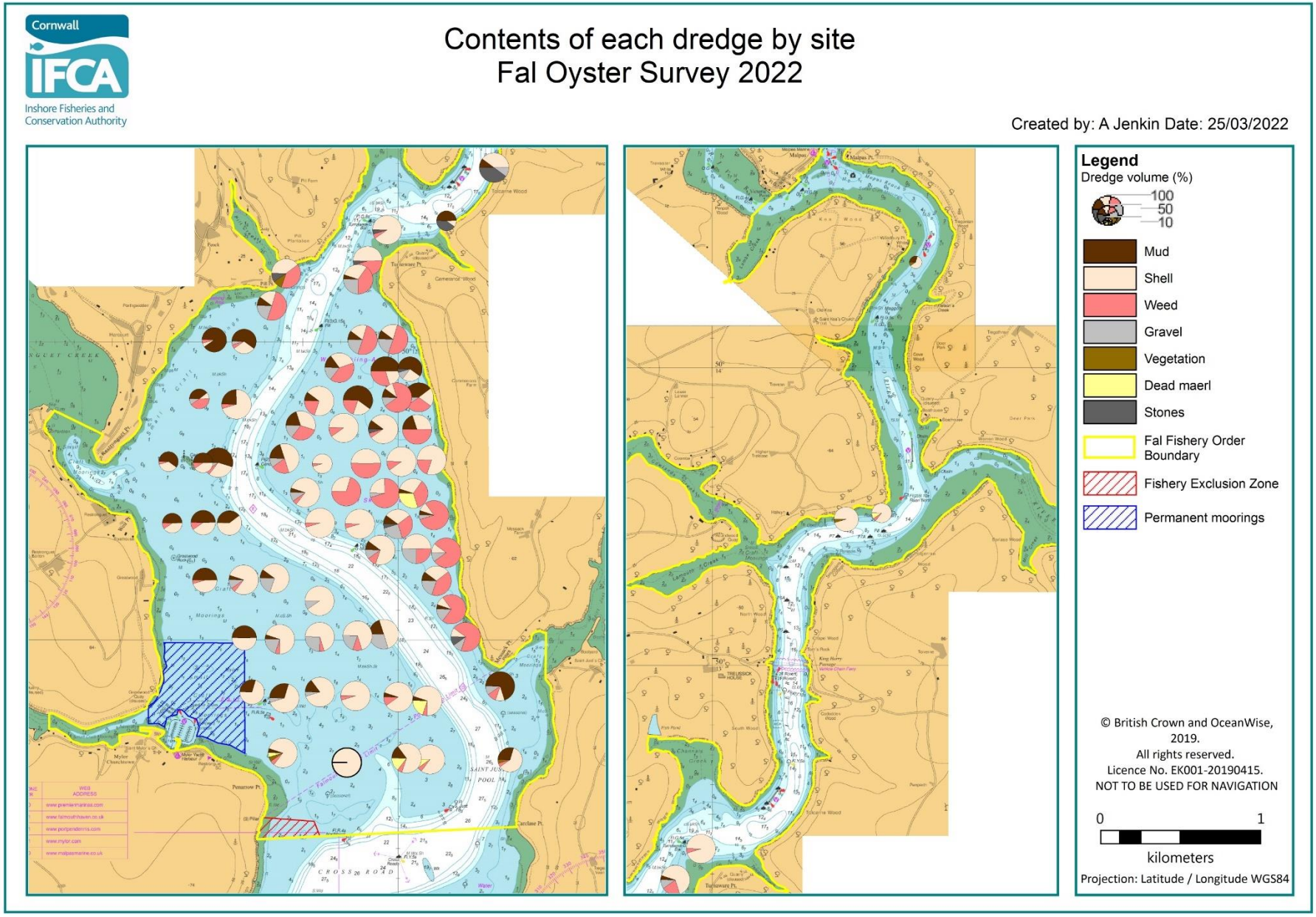
Annex 1: Site Map

Annex Figure A: Fal and Helford SAC Site Map (Magic, 2020).

Annex 2: SAC feature map



Annex Figure B: Fal and Helford SAC feature map (Magic, 2020)



Annex Figure C: The dredge volume and the contents of each dredge per site recorded during the Fal oyster survey 2022 (Taken from: Jenkin *et al.,* 2022).

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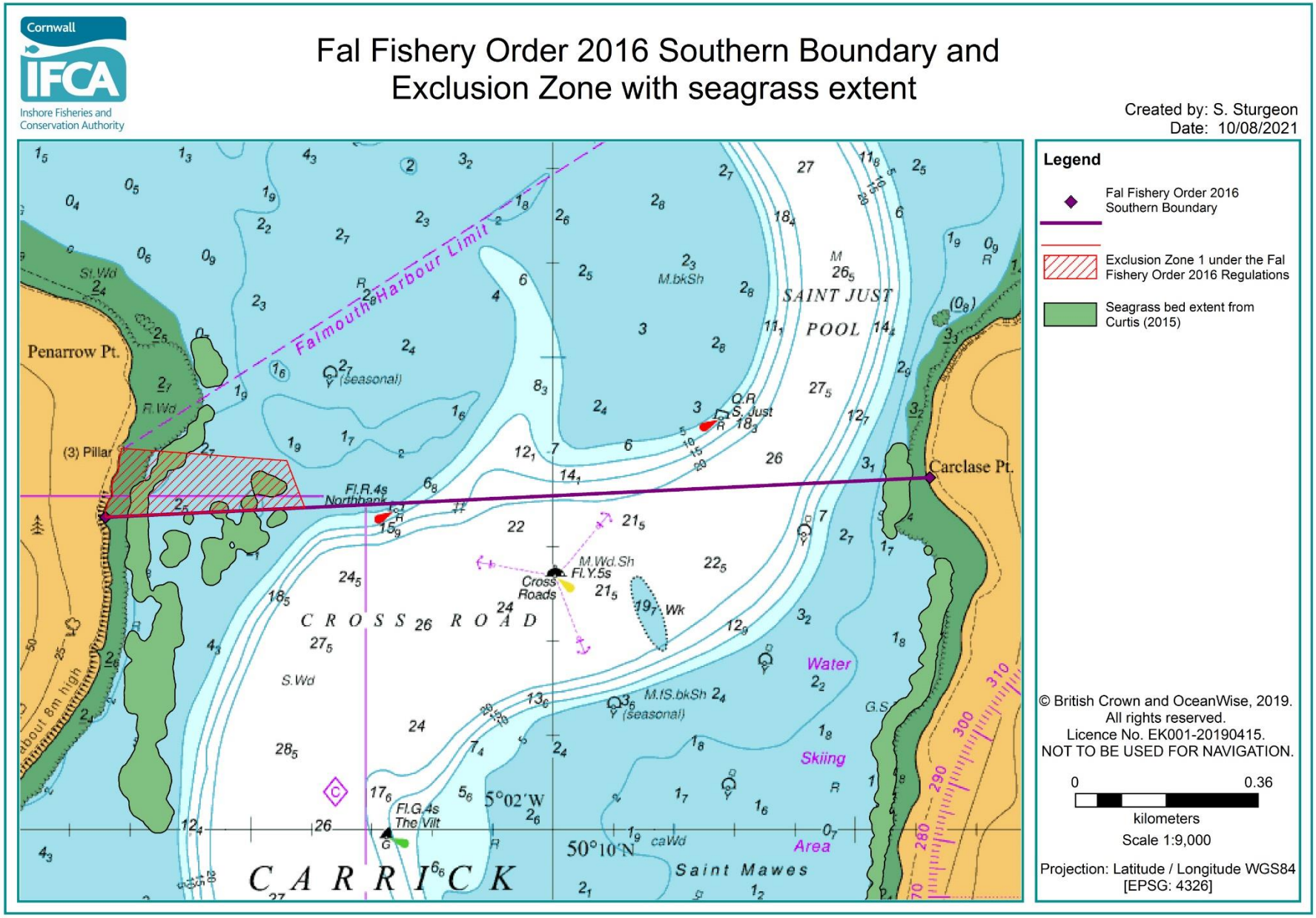

Annex Figure D: The extent of seagrass beds within and near the southern boundary of the Fal Fishery Order 2016 and the Exclusion Zone. Seagrass extent is from the Fal and Helford SAC Seagrass Condition Assessment in 2015 carried out by EcoSpan (Curtis, 2015)

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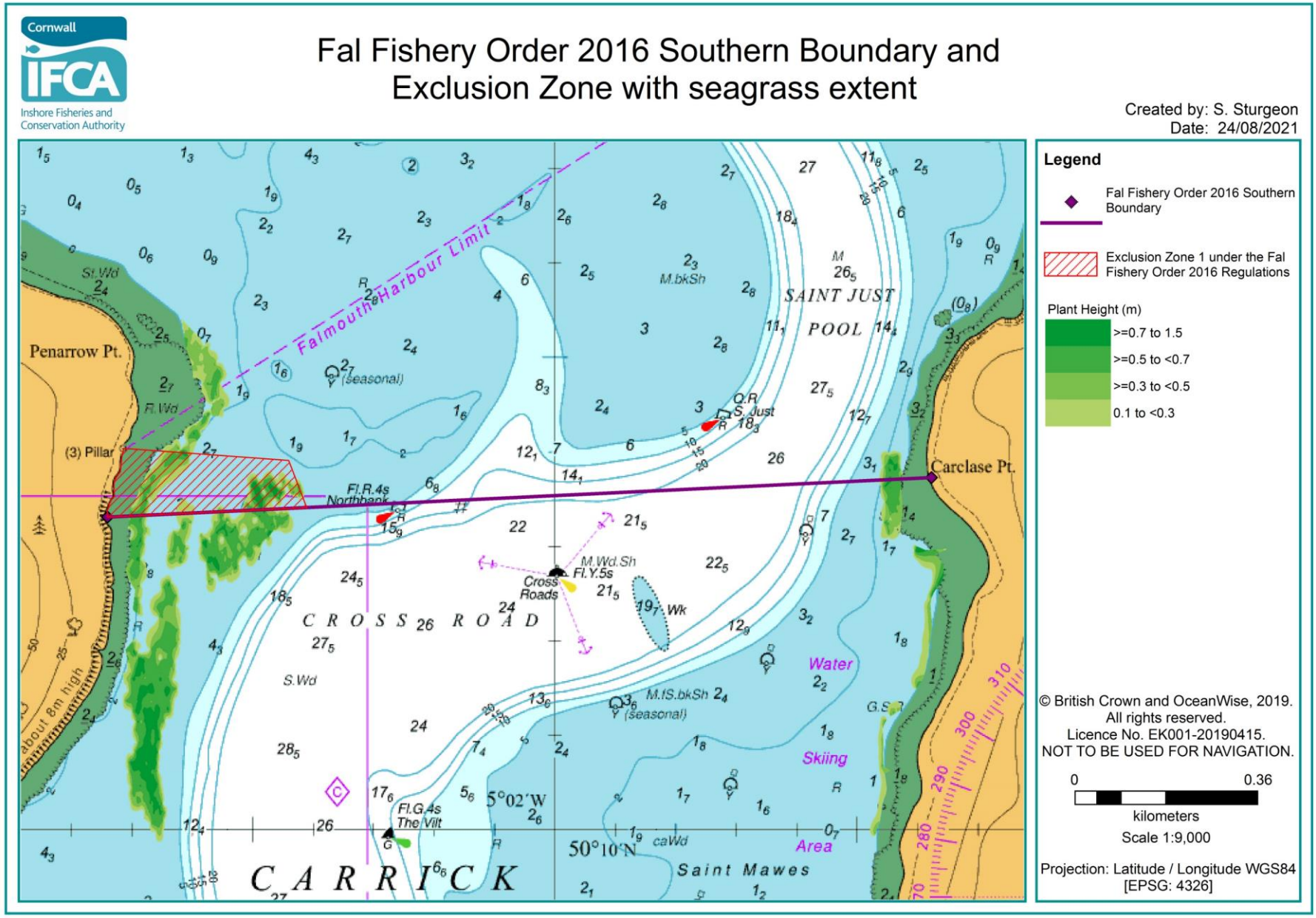
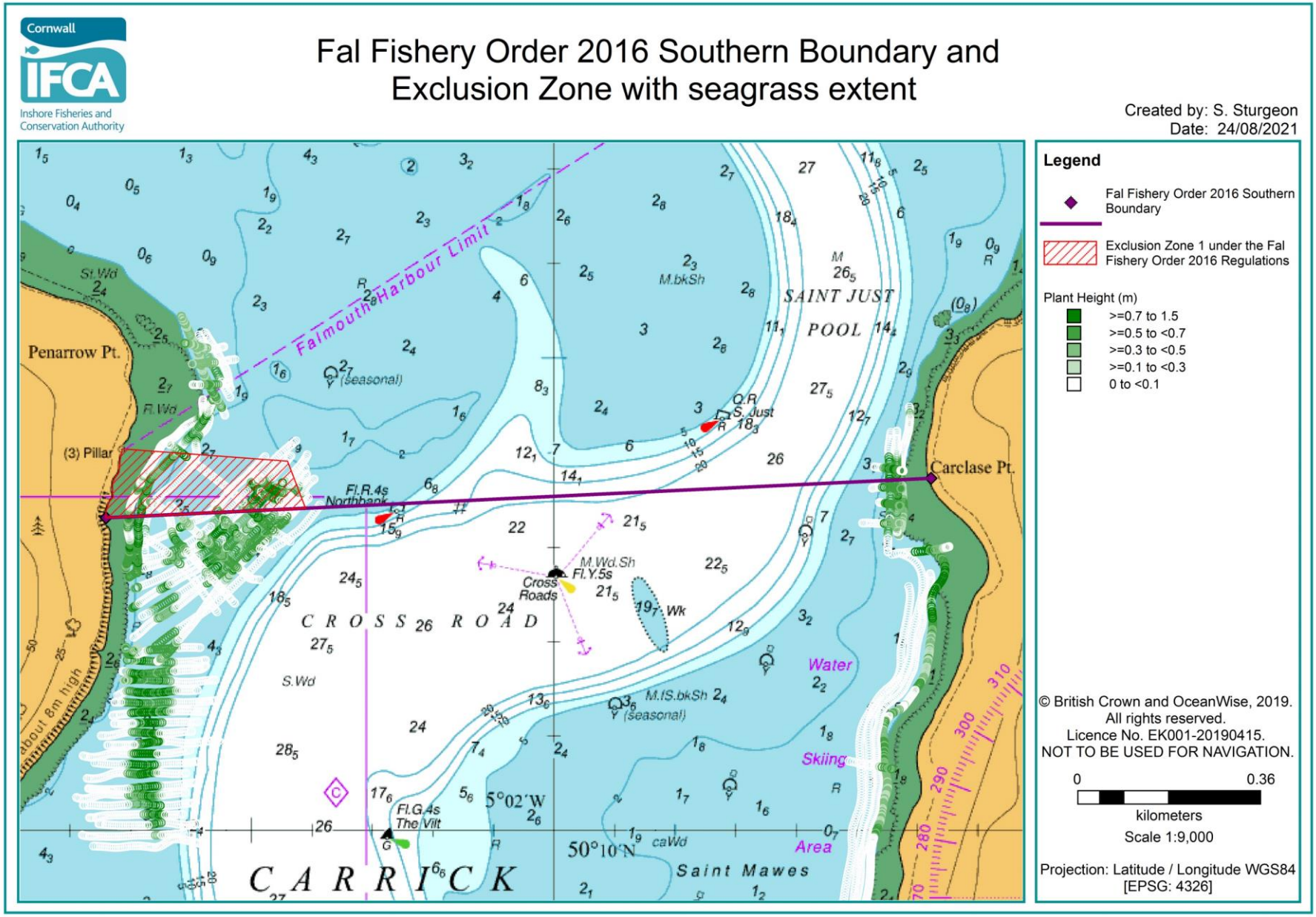


Annex Figure E: Contour plot displaying height (m) of seagrass recorded using a MX Aquatic Habitat Echosounder by Cornwall IFCA in 2021 within and near the southern boundary of the Fal Fishery Order 2016 and the Exclusion Zone.



Annex Figure F: Survey lines and height (m) of seagrass recorded using a MX Aquatic Habitat Echosounder by Cornwall IFCA in 2021 within and near the southern boundary of the Fal Fishery Order 2016 and the Exclusion Zone.

Annex 3: Fishing Activities within the site

Annex Table A: Fishing activity levels within the Fal and Helford SAC

Natural England Aggregated Method	Matrix Gear Type	Specific Gear Type	Does the fishing activity take place within the SAC?	Level of the activity occurring	Justification/ Evidence used
Demersal trawl	Towed (demersal)	Beam trawl (whitefish)	N	Activity prohibited under Cornwall IFCA Closed Areas (European Marine Sites) No. 2 Byelaw	Cornwall IFCA officer knowledge
		Beam trawl (shrimp)	N		
		Beam trawl (pulse/wing)	N		
		Heavy otter trawl	N		
		Multi-rig trawls	N		
		Light otter trawl	N		
		Pair trawl	N		
		Anchor seine	N		
		Scottish/fly seine	N		
Dredges	Dredges (towed)	Scallops	N		
		Mussels, clams, oysters	N		
		Pump scoop (cockles, clams)	N		
	Dredges (other)	Suction (cockles...)	N		
		Tractor	N		
Traps	Static - pots/traps	Pots/creels (crustacea/gastropods)	Y		
		Cuttle pots	Y		
		Fish traps	Y		
Anchored Nets/ Lines	Static - fixed nets	Gill nets	Y		
		Trammels	Y		
		Entangling	Y		
	Lines	Longlines (demersal)	Maybe	Not aware of this activity occurring – but might do	
Pelagic fishing	Towed (pelagic)	Mid-water trawl (single)	N		
		Mid-water trawl (pair)	N		
		Industrial trawls	N		
	Passive - nets	Drift nets (pelagic)	Maybe	Not aware of this activity occurring – but might do	
	Ebb nets	Ebb net (pelagic)	Y		
	Lines	Longlines (pelagic)	Maybe	Not aware of this activity occurring – but might do	
		Handlines (rod/gurdy etc)	Y		
		Jigging/trolling	Y		
	Seine nets and other	Purse seine/ring nets	Y	Ring netting	
Shore-based activities	Bait collection	Bait dragging	N		
		Crab tiling	Maybe	Not aware of this activity occurring – but might do	
		Digging with forks/ Bait digging	Maybe	Not aware of this activity occurring – but might do	
	Seine nets and other	Beach seines	Y		
		Shrimp push-nets	Y		
		Fyke and stake nets	Maybe	Not aware of this activity occurring – but might do	
	Intertidal handwork	Hand working (access from vessel)	Maybe	Not aware of this activity occurring – but might do	

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Natural England Aggregated Method	Matrix Gear Type	Specific Gear Type	Does the fishing activity take place within the SAC?	Level of the activity occurring	Justification/ Evidence used
		Hand work (access from land)	Y		
Diving	Miscellaneous	Commercial diving	Y		

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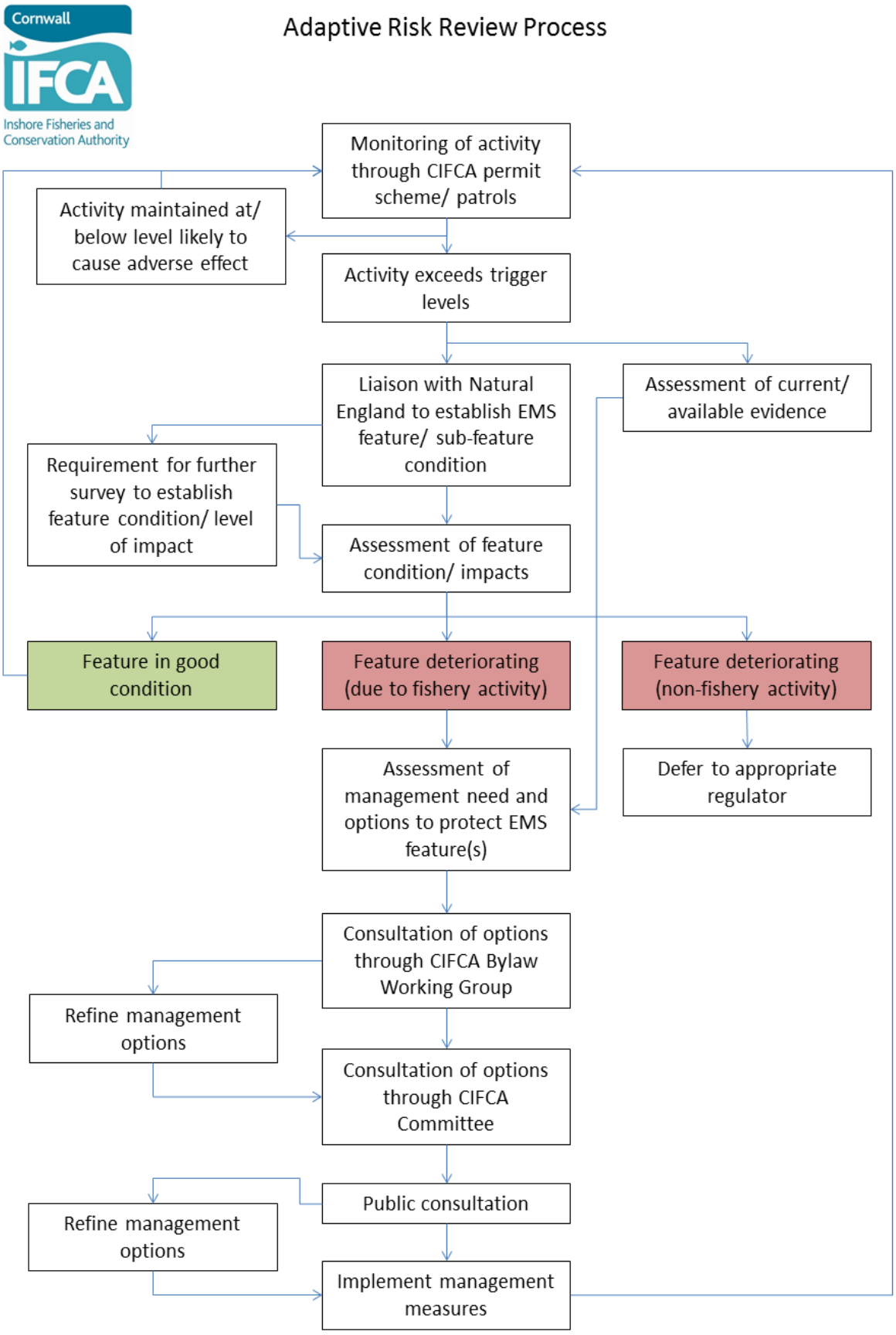
Annex 4: Adaptive risk review process



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Annex 5: Natural England's Consultation Advice

Date: 26th September 2022
Our ref: 403769
Your ref: Fal Fishery Order 2016 HRA 2022-23 Season

Stephanie Sturgeon
Cornwall IFCA
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North Quay
Hayle
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BY EMAIL ONLY

Dear Steph,

Formal Advice to Cornwall IFCA: Habitats Regulations Assessment (HRA) for the Fal Oyster Fishery 2022-23.

Thank you for the above assessment, received by email on 12th August 2022.

Natural England has considered the Habitats Regulations Assessments (HRA) prepared by Cornwall IFCA for the purposes of making an assessment consistent with the provisions of Article 6(3) of the Habitats Directive[123]. Please accept this letter as Natural England's formal advice.

Assessment has been made of the effects of the Fal Fishery Order (2016) on the Fal & Helford SAC. We are content that the best available and most up-to-date evidence has been used by Cornwall IFCA to carry out the HRA and determine whether management is required to ensure the protection of site features from direct and indirect impacts of the collection of marine fisheries resources.

It is Natural England's view that Cornwall IFCA officers have appropriately identified: (1) activities likely to have a significant effect on the site's conservation objectives; and (2) whether management measures are required in order to ensure there will be no adverse effect on the integrity of the European Marine Sites.

Following findings of live maerl fragments during the Fal Oyster Survey 2019, 2020 and 2022 we welcome Cornwall IFCA's commitment to investigate the density and distribution of live maerl within the southern part of the Fishery with a drop-down video survey. This evidence will determine if a review of management options to ensure potential impacts are adequately mitigated is required.

We note Cornwall IFCA's acknowledgement that progress still needs to be made on licence returns and welcome improvements to ensure full data can be acquired.

In considering this HRA, Natural England believe that any foreseeable risk or harm to designated sites has been appropriately assessed. We believe that Cornwall IFCA's ongoing commitment to monitoring this fishery, together with the application of the current thinking on Adaptive Risk Management, provides a robust mechanism for re-assessing this risk. This view is based on our current knowledge of the impact of relevant fishing activities on designated site features.

[23] Defra revised approach: https://www.gov.uk/government/publications/revised-approach-to-the-management-of-commercial-fisheries-in-european- marine-sites-overarching-policy-and-delivery

Please do not hesitate to contact me if you require further information.

Yours sincerely,

Jules Webber
Devon, Cornwall & Isles of Scilly Area Team
Natural England